

THE
RAY SOCIETY

INSTITUTED MDCCCXLIV



LONDON

MDCCCXLV.

REPORTS
ON THE PROGRESS
OF
ZOOLOGY AND BOTANY

AS: SOC: B

1841, 1842.



EDINBURGH
PRINTED FOR THE RAY SOCIETY
MDCCCXLV

206m

37597

SO. NO 064871

PRINTED BY W. H. LIZARS, EDINBURGH

ADVERTISEMENT.

THE principle of establishing Societies for the purpose of publishing such works, in various departments of literature and science, as would otherwise be inaccessible, has now become so generally recognized, as to render any defence of their institution wholly unnecessary.

The Parker, the Camden, the Percy, the Sydenham, and several other Societies, have been formed for the purpose of supplying a demand for particular kinds of literature, which the ordinary means of publication could not be brought to meet. Following in the footsteps of these respectable Associations, the RAY SOCIETY recognizes as its object, the easy acquisition of works on Natural History, more particularly in Zoology and Botany, which, from various circumstances, cannot be readily procured. In one point, the Ray Society will, indeed, differ from most, if not all, of those which have preceded it—in the publication, namely, of original modern works, or memoirs in Natural History, which, from the expense of their publication and the improbability of a sufficiently extensive sale, would not be undertaken by a publisher at his own risk, or printed in the transactions of existing Societies. The Council of the Ray Society are very anxious, that this point

should be understood by the members and the public, as they have no intention of invading the province of the publisher.

According to the present constitution of the Ray Society, the following are the classes of works which the Council contemplates being able to supply to the members :—1. Original Works in Zoology and Botany. 2. New editions of Standard Works of established value. 3. Rare Tracts and Manuscripts. 4. Translations of foreign works, ancient and modern. Under each of these departments the Council has already had suggested to them works for publication, the appearance of which, they feel confident, will be very acceptable to the members of the Society, and materially aid in the extension of the sciences of Zoology and Botany.

In selecting a name for the Society, the Council have felt no difficulty, as every one will recognize the propriety of designating it after the first of British Naturalists. And in presenting the first volume to the members of the Society, they would have gladly rendered it the vehicle of matter having reference to the labours of Ray; but, as this has been found incompatible with the early publication of a volume, they hope the Reports on the Progress of Zoology and Botany, for the past few years, will not be deemed an inappropriate commencement of their labours.

CONTENTS.

	Page
THE STATE OF ZOOLOGY IN EUROPE,	
By C. L. BONAPARTE	1-43
In Britain	4-10
— Sweden	10-12
— Denmark	12
— Russia	12, 13
— Prussia	14-17
— Switzerland	18-20
— Holland	20-24
— Belgium	24-26
— France	26-34
— Spain	34
— Portugal	34
— Italy	35-43

THE PROGRESS OF ZOOLOGY IN 1842

1. MAMMALIA, by Prof. Andr. Wagner	3-67
Quadrumanæ	17-24
Chiroptera	24-28
Insectivora	28-33
Carnivora	33-37
Marsupialia	38-40
Rodentia	40-59
Edentata	59, 60
Solidungula	60, 61
Pachydermata	61, 62
Ruminantia	62-67
Cetacea	67

	Page
2. BIRDS, by Prof. Andr. Wagner	68-90
Accipitres	74
Passerinae	75-81
Clamatores	81
Zygodactyli	82-84
Columbinae	85
Gallinaceae	85, 86
Cursores	86
Grallae	87, 88
Natatores	88-90
3. REPTILIA, by Dr. F. H. Troschel	91-99
Chelonii	94
Saurii	94-96
Serpentes	96-99
Batrachia	99
4. FISHES, by Dr. F. H. Troschel	100-115
Acanthopterygii	105-108
Malacopterygii	108-114
Lophobranchii	114
Plectognathi	114
Cyclostomi	115
Plagiostomi	115
5. MOLLUSCA, by Dr. F. H. Troschel	116-149
Cephalopoda	120
Pteropoda	121
Heteropoda	121, 122
Gasteropoda	122-145
Pulmonata	122-130
Ptenobranchia	130-142
Pomatobranchia	142
Gymnobranchia	142-144
Aspidobranchia	144
Cyclobranchia	144
Tubulibranchia	145
Cirribranchia	145
Conchifera	145-149
Tunicata	149
6. INSECTS, ARACHNIDA, CRUSTACEA, and ENTOMOSTRACA, by Dr. W. F. Erichson	150-279
Coleoptera	156-218

	Page
Orthoptera	218-230
Hymenoptera	231-239
• Strepsiptera •	239
Lepidoptera	240-256
Hemiptera	256-262
Thysanura	262
Parasita	262.
Fossil Insects	263
• Arachnida	263-270
Araneæ	264
Solifugæ	265
• Opiliones	267
Acari	267-269
Pycnogonides	270
Crustacea	270
Decapoda	270-274
Stomopoda	274
Amphipoda	274-276
Isopoda	276
Myriapoda	276, 277
Entomostruca	277-279
Phyllopoda	277
Siphonostoma	278
Cirripedia	279
 7. ANNELIDES, by Prof. C. Th. V. Siebold	 280-289
 8. ENTOZOA, by Prof. C. Th. V. Siebold	 290-318
Gordiaceæ	292-298
Nematoidea	298-302
Acanthocephala	302
Trematoda	303-313
Cestoidea	313-314
Cystica	314-316
Helminthes, d. g.	316
Pseudo-Helminthes	317 •
 9. ECHINODERMATA, ACALEPHÆ, POLYPI, and INFUSORIA, by Prof. C. Th. V. Siebold	 319-348
Echinodermata	319-330
Acalephæ	330-334
Polypes	334-343
Foraminifera	343-348
Infusoria	343-348

	Page
THE PROGRESS OF PHYSIOLOGICAL BOTANY IN 1841, By DR. H. F. LINK	1-104
Internal Structure of Plants	4-32
Stems, Leaves, and Buds	32-57
Roots and Tubers	57, 58*
Flowers	59, 60
Impregnation—Ovule—Seed	60-68
Anomalous Phanerogamia.	
A. Parasites	69-72
B. Lemnaceæ	72, 73
Ferns	73-77
Mosses	78, 79
Lichenes	79, 80
Algæ	80-84
Fungi	84-86
Monstrosities	86-91
Secretion	91-94
Spermatozoa in Plants	94-96
Growth—Nutrition	96-100
Miscellaneous	100-104

OBSERVATIONS
ON THE
STATE OF ZOOLOGY IN EUROPE,
AS REGARDS THE VERTEBRATA.

READ AT THE THIRD MEETING
OF THE ITALIAN CONGRESS OF SCIENCE, FLORENCE, 1841.

By
CHARLES LUCIAN BONAPARTE,
PRINCE OF CANINO AND MUSIGNANO.

TRANSLATED FOR THE RAY SOCIETY,
BY
H. E. STRICKLAND, M.A., F.G.S.

OBSERVATIONS

ON THE

STATE OF ZOOLOGY IN EUROPE, &c

WHEN it was proposed last year, at the Turin meeting, that some person should be requested to give an account to the members, at the ensuing meeting, of the scientific researches which might be made during the year in all countries, especially as regarded new discoveries on subjects relating to the respective sections, I pointed out the great difficulties which presented themselves, particularly in regard to Zoology. I remarked, that expectations would thus be aroused, which could not be accomplished by a single person, and that any one who should earnestly and diligently undertake so difficult a task, might easily incur the criticisms of those, who in particular departments, were acquainted with details of which he was unavoidably ignorant. Besides, who could assure himself, that the work would ever be fully accomplished? What security could be found, that he who undertook it would not be interrupted by the arrival of the future meeting? It appeared to me, also, to be more consonant with the independence of our pursuits, and more conducive to that spirit of intercommunication, which is a chief object of our meetings, that every one should use his own privilege, of informing the members, of whatever has, to his knowledge, been effected during the year in those places where literature and science are pursued.

And as each one could append to such a statement his own ideas, and follow his own views in explaining the subject, the work would thus be rendered more complete, and no one would be unduly injured in his own estimation, or discouraged from joining in this most useful but most extensive undertaking.

On further considering the subject, I regretted not to have proposed it at Turin, as it would have been in favour of such a plan, that the many learned members there assembled, might, by combining their materials, have erected such an edifice with great success. Be that as it may, however, by making use of many books and journals to which I had access, and also a considerable amount of correspondence, with which zoologists in most parts of the world have honoured me; aided too by the inspection of many museums, during my various journeys since October last (including a visit to Lyons during the recent scientific Congress of France), I am enabled to lay before you such notes on the subject as I could collect, hoping that you will all be willing to aid in rendering them more perfect.

BRITAIN.

COMMENCING with Great Britain, I think I ought, before all others, to make mention of the work to which Gould is devoting great study, labour and expense, entitled the "*Birds of Australia*," and for the sake of which he visited Australia with all his family, and remained there more than two years. That distinguished zoologist entrusted to me the first number of his work, that I might present it to this meeting; a work, as you all see, truly superb and marvellous, and capable of adding to a fame which already seemed to have reached its ultimatum. He showed me about 500 species of Birds, many among them of wholly new genera, and many others belonging to genera, which in Europe are very poor in species, such, for instance, as *Platalea*, *Himantopus*, and others; all which he will figure and illustrate in the truly excellent mode which you see in the specimen before you, together with an account of

their manners and habits, from the egg to maturity, and that too, from a country whence hardly 150 species were before imperfectly known. Besides those anomalous animals from Australia, which are already celebrated, you will be interested in seeing others added, of which we had before no notion. I will here limit myself to mention two only, the first of which is the *Talegalla lathamii*, till now a subject of dispute, as to whether it was a gallinaceous bird or a vulture. These birds have the habit of uniting together in communities, and of collecting, by the aid of their feet alone, vast mounds of vegetable matter, disposed to fermentation, and prepared for the reception of their eggs, which in due time they bury at intervals of a foot, and with the point downwards. Another new bird, called by Gould, *Leipoa ocellata*, makes mounds of sand for the same purpose. There are also two species of Passerine Birds (*Chlamydera*, Gould), which form, with marvellous skill, a gallery, I might rather call it a covered terrace, for the purpose of walking there and playing with the females, which terrace one species decorates with shells, the other with feathers of various colours. Nor has Gould confined himself to Birds, for while making observations and collections in all the classes, he has especially attended to the *Marsupial* animals, of which he has published an entire series, admirably figured. By the help of these figures, and the never sufficiently praised researches of the celebrated anatomist Owen, this sub-class of animals, hardly known a few years since, will be illustrated in a manner adequate to the singularity of its characters.

The whole class of Mammalia is more effectually studied in England than elsewhere, not so much because the museums of that country are the richest in those animals, as from the fact, that those zealous naturalists readily undertake long and expensive journeys, for the sole purpose of verifying the objects of their studies in the museums of all other nations, and of cancelling or adopting the species which have been proposed or suspected, thus rendering more perfect the critical department of science; while, on the other hand, allow me to remark, that continental naturalists, although worse supplied with specimens, rarely or never visit London with this object. In reference to

Mammifers, not to mention the well known labours of Bell, and the useful researches of the encyclopædic J. E. Gray, who so worthily superintends the first zoological museum in the world; there are, at present, three men who are earnestly engaged on this class in Britain—Martin, Waterhouse, and Ogilby. The first, if it had not been for the unfortunate failure of a publisher, would probably have finished a complete general work on the Mammalia, the commencement of which, embracing only the varieties of Man and the *Simiidae*, forms a luminous sample of a work worthy of all praise, and leaves in us a lively and unhappily insatiable desire for the remainder. Mr. Waterhouse, who occupies the enviable position of Curator to the Museum of the Zoological Society of London,* and who founds his researches upon the structure of the cranium, to which, however, he perhaps attaches too exclusive an importance, has given us some excellent monographs, of which I beg to offer as a specimen to this meeting, that of the *Galeopithecii*, in which group he establishes, on good grounds, two species. He has also arranged the *Carnivora* into new and very natural groups, giving his chief attention, however, to the *Rodentia*, in regard to which we may depend upon his work being most perfect, as he has promised to figure the entire series of this very intricate order. Of Mr. Ogilby, the worthy secretary of the same Zoological Society, it is sufficient to allude to the friendship and renown which he enjoys among men of science. He spares no exertion to increase his extensive knowledge of Mammalia, with the view of publishing, in due time, a general work on species. Meanwhile, he does not cease to publish memoirs on many questions connected with this subject, especially on the *Ruminantia*, which he has arranged in a much more philosophical manner than was before known. And even those who, like myself, cannot attach so great an importance to the organs of locomotion and of prehension, as he is disposed to do, must admit, that even the abuse of this principle has in his hands been beneficial to science. By conversing in

* Mr. Waterhouse does not now occupy this position, but he is equally well placed for the study of Zoology, as Assistant Curator in the British Museum.—ED.

London with men of this stamp, and aided especially by the two last named, I have remodelled the Catalogue which I have been for some years compiling, of all the Genera of Mammifers, and which, with your permission, I propose to read on another occasion, not doubting that I shall be much aided by your observations on the application of my system to so important a branch of Zoology. Mr. Jenyns, the well known author of the *Manual of British Vertebrate Animals*, pursues his varied investigations into the small Mammifers of those islands; and, in a late excellent memoir, corrects all the errors into which he had fallen. He has published a new species of *Arvicola*, under the expressive, though not laudable, name of *neglecta*, which species I believe not only to be a good one, but to occur on the continent also, being nothing else than the true *agrestis* of Linnæus and Nilsson, which has been brought to light by De Selys Longchamps.

Ornithology flourishes in Britain more than ever, as is proved, not only by the various inimitable works of Gould before spoken of, but by those of Macgillivray, of Eyton, of Yarrell, of Jardine, and of Selby. The two last authors have united to resume, after a short interruption, but with increased energy and improved execution, their beautiful *Illustrations of Ornithology*. If the United Kingdom has to deplore the irreparable loss of the erudite Vigors, and the far removal of Swainson, who nevertheless may render great service to Ornithology in New Zealand, it may yet console itself with the labours of Mr. George Robert Gray, a worthy brother of the well known naturalist of that name. This gentleman, having laid aside Entomology, seems desirous of applying himself more strictly to the study of Birds, which are now his special department in the British Museum; and while peacefully engaged in arranging them in the magnificent and splendid gallery, lately built for them at the national expense, he has not neglected to send to press, a second edition of his *List of the Genera of Birds*, the first edition of which was already celebrated as the most complete comparative work known on that subject. He and I mutually satisfied ourselves on many of the details of that class: he was also willing to adopt many particulars

of my Classification, so that our final labours will differ but slightly from each other. Great Britain may also congratulate itself on another ornithologist, Mr. Strickland, who, in his brief criticisms on the works of others, has shown himself well acquainted with a subject which he proposes to treat of more at large. Mr. Blyth, the secretary of the Ornithological Society, has left London to reside in India, at the head of one of the chief scientific establishments; a new observer will thus be added to the Hodgsons, the Sykeses, and others, to inform us of the Vertebrate Animals of those regions. Maclelland has published a Paper on the Birds and Quadrupeds of Assam, on the remote frontiers of China.

Britain has contributed little or nothing to Erpetology since the elegant work of Mr. Bell on British Reptiles. I am only able to mention with praise, the short descriptions given by Mr. J. E. Gray, of the most interesting species in the British Museum, and the not very successful attempts at the classification of the *Batrachia* by Mr. J. Hogg.

Ichthyology is there continually extended by the labours of Mr. Yarrell on the Indigenous Fish. Messrs. Thomson, Parnell, M'Coy, and others, also continue to describe new species, without, however, sufficiently studying continental works, in consequence of which they occasionally publish as new, species which are only remarkable as being found for the first time in that country. Allow me to mention an example of this in my *Torpedo nobiliana*, which has been reproduced under two different names. Sir William Jardine is publishing a magnificent work on the *Salmonidae*, of which I have recommended the distribution of prospectuses. Mr. Low is bringing before the public, in a handsome form, the Fish of Madeira, the comparison of which, with those of our seas, will supply some important information. There are also in Britain other authors, who, from time to time, make known some of the rare fish, brought from the numerous colonies of that country. I ought not to pass over the ichthyological researches, exhibited in beautiful plates, and carefully edited letter-press, by Dr. A. Smith, in his work on the Zoology of South Africa, and by Mr. Darwin, in the Zoology of the Voyage of the Beagle,

in which the new species of Birds are illustrated by Gould, the Fossil Mammalia by Owen, and the existing ones by Waterhouse. I cannot, however, refrain from remarking, that Ichthyology, and, as I said before, Erpetology, are far from being cultivated in Britain so fully as the two superior classes of Vertebrate Zoology.

The United Kingdom is adorned, especially in its manufacturing towns, with zoological museums, more or less complete and well arranged. There are also formed (and the taste is on the increase), vivaria of all kinds of animals, in beautifully situated gardens, at the head of which are the magnificent Zoological Gardens of London, where we have lately heard of the birth of a Giraffe, which is being successfully reared. New societies which rise in all quarters, and which, being confined to particular objects, are better adapted than the more comprehensive ones, to the making tranquil observations, contribute remarkably to a more perfect knowledge of animal beings. The extension of zoological science in Britain is further advanced by the meetings of the British Association, as may be seen in various periodical journals, which are too many to enumerate. I will merely mention, that the report of Mr. Thomson, on the Zoology of Ireland, is a valuable and lucid essay which faithfully exhibits the subject, and seems to me worthy of imitation. The union into one of the two best magazines of natural history, which took place last year, is chiefly owing to the departure for America of Mr. Charlesworth, the young editor of one of them.* Science, however, will be no loser, if by means of the English privileges of impartiality and freedom of insertion, the surviving journal continues to maintain its former reputation. I cannot omit to mention the importance of the *Proceedings of the Zoological Society*, although they have been so roughly censured by an eminent author. What shall I say of their *Transactions*, published with so much careful attention and splendour? Meantime, the *Transactions* of more ancient origin, such as those of the Linnæan, the Wernerian, the Royal, and other Societies,

* Mr. Charlesworth has since returned, and is now Curator of the Museum of the York Literary and Philosophical Society.—Ed.

still continue to be published. The *Library of Natural History*, edited by Sir W. Jardine, continues to flourish with the progress of science; and, among its many merits, I consider the greatest to be, that it favours the diffusion of knowledge, by the low price at which these learned and elegant treatises, adorned with excellent coloured figures, may be purchased. This eulogium is fully justified by the latest volumes, including those of Hamilton Smith on Dogs and Horses, and especially that of Waterhouse on the Marsupials. The zoological volumes of the *Library of Entertaining Knowledge* are no less deserving of praise, as well as the learned ones of Lardner's *Cyclopædia*, and the articles scattered, alphabetically, by the pen of a Broderip, in the widely circulated *Penny Cyclopædia*, which has served as a model to so many similar works.

SWEDEN.

SWEDEN has not departed from the station to which Linnæus raised her. In the department of Vertebrata (to which, as you are aware, I confine this sketch), her eminence is worthily sustained by Professor Nilsson, who occupies himself with equal success in all the four classes, and has shown himself a complete master of each, in his *Fauna Scandinavica*. This work is unfortunately written in the Swedish language, which is very unfavourable to the diffusion which it deserves; and the same is also the case with his other work, the *Illuminade Figurer till Skandinaviens Fauna*. That author has informed me, that he is also preparing a special work on the *Phocidæ*, of which he has carefully studied the specimens preserved in the museums of Berlin, London, and Paris. Nor can I pass by a valuable letter, which he has lately written to me, in which he clearly proves, that the *Lepus timidus* of Linnæus, and more particularly the species described in the *Fauna Suecica*, is not the common hare of the continent of Europe, which does not occur in Scandinavia at all, but is the *Lepus variabilis* of Pallas, as is clearly shown, by the phrase *æstate cinereus hyeme semper albus*, and especially

by the character, *cauda abrupta, semper alba*. In that hare, moreover, Nilsson recognises two distinct forms, which I would regard as two good species, and the rather, because the hares of different countries seem to me not to have been sufficiently compared. The same naturalist has recognised six Swedish species, of that very difficult genus, *Lemmus* or *Arvicola*, viz.,—the *norwegicus*, the *amphibius*, a new species from Lapland, which he calls *medius*, the *arvalis*, the *rutilus*, and the *glareola*. He has also discovered in Scania, the most southern province of Sweden, the *Mus betulinus* of Pallas, which he clearly proves not to be a *Mus*, but to belong, in reality, to the very distinct genus, *Sminthus*. Nor ought I to pass over some facts, from which he advises me to cancel my *Sciurus italicus*, but which rather confirm the existence of a species hitherto mistaken by others. I beg, therefore, the meeting to test this species, by the very rules which my learned opponent suggests, referring to the skulls which I here exhibit. A more just objection is made by him to the criticism of Temminck, on the shortness of the claws in the Plates 6 and 7 of his *Lagopus subalpinus*, a critique which originated in Temminck not being aware, that the bird changes not only its feathers but its claws, which last are longest only in winter; a provision which adapts it to scratch the hardened snow, just as the white plumage enables it to remain unobserved by rapacious animals, upon the whitened surface of the ground. The light thrown by Nilsson on the Ichthyology of the Baltic is well known; I will merely mention one of his more recent discoveries, viz.,—an obscure species of *Salmonidæ* from that region, and a second species of the Mediterranean genus, *Argentina*. In that country also is continued, and now nearly completed, the purely Iconographic work of Wright, on the Birds of Sweden. Sundevall also, who has given us an ornithological system, abounding in sound science, continues to publish, in the Swedish periodicals, the descriptions of various birds of that country. Let us unite in lamenting the death of the Ichthyologist Fries, and let us be thankful, that his surviving colleague, Erckstrom, continues, in a praiseworthy manner, the magnificent work on the Fish of Scandinavia, which they

published in common, and which has already thrown much light on the Fish of Europe, including even the southern parts; and although some errors occur in it, they certainly appear to arise not from negligence or from wrong views, but from hypercriticism. The continuation of this work is rendered the more valuable, now that Sundevall has joined in the undertaking; and the Latin translation which accompanies it will make it more extensively known.

DENMARK.

DENMARK also contributes to the advancement of Zoological Science. It is from thence that Lund departed to South America, where he has collected a rich harvest of antediluvian animals. The Transactions also of their Academies testify to Danish science, as do the writings of Professor Reinwardt, and among which I ought specially to mention his excellent description of the celebrated *Bogmaro*, a Fish of the genus *Trachypterus*; also the Danish Ichthyology, in course of publication by Kroyer, who, moreover, has published a Journal of Natural History since the year 1836.

RUSSIA.

THE vast empire of Russia is also powerful in Science, of which we have an incontrovertible proof, in the honourable rivalry between the two Academies of Moscow and Petersburg. Nor let us wonder, that it flourishes under the direction of an Ouwarow, who gave us a written proof of his great and valuable interest in the Italian Congress. After the impulse given, by the long desired publication of the *Fauna Rossica* of Pallas, a Krynicki, an Eichwald, a Ménétries, a Brandt, a Nordmann, strove to reap the well sown field. Of M. Brandt's writings, I have only seen the first and second parts of his *Spicilegia Ornithologica*, which makes me impatient for their continuation, inasmuch as the learning there exhibited, would do honour

to countries which boast of being far more civilized. The recent labours of the same author, on the *Pelecanidæ* and the *Alcidæ*, rival his former writings on the *Hystrires* and the *Solenodon*.

We may here speak of a Russian work, though printed at Paris in the French language; the Travels in South Russia of Prince Demidoff, who, after himself directing an expedition that would do honour to a state, whether we consider the individuals that composed it, or the measures taken to ensure the most successful results, has spared no effort to render his work perfect, accompanied as it is with all the typographic splendour which the French metropolis supplies. The zoological part of the work is wholly from the pen of Nordmann, who has also superintended the execution of the magnificent plates, among which those of *Mammalia* and Fish are specially to be admired. The text supplies a desideratum in the European Fauna, which was very deficient in its eastern portion; and it will, therefore, deserve an attentive examination. Of the Batrachians no notice is taken, and some orthographical errors have occurred to me, which sometimes obscure the sense; as, for instance, the Serpent, called *Callopeltis leopardinus*, has no other resemblance with *Cœlopeltis* than that of the name. Useful observations, however, I need hardly remark, are deduced from every part of the work, and the two following have occurred to me in merely turning over the pages:—The *Pleuronectes nasutus* of Pallas, is nothing else than the Sole of Porro (*Solea lascaris* of Risso); an inspection of the plate of the *Callionymus festivus*, has convinced me, that it is my *Callionymus dracunculus*, the fish so called by Rondeletius and Linnæus. The especial memoir on the *Pastor roseus*, whose habits were not previously well known, is deserving of all praise. The observations on the Scales of Fish, by Professor Mandl, are the more important, because they serve to correct some misconceptions of Agassiz, although they are far from weakening his theory on the growth of scales, which is the foundation of his system of Ichthyology.

PRUSSIA.

RETURNING from Russia towards Germany, and resting a while in Prussia, I behold in her capital a museum, which, in many branches, especially in Ornithology, is the richest in the world. Its director, Professor Lichtenstein, continues to occupy himself chiefly with *Mammalia*, and with Monographs of Aquatic Birds. Wiegmann, the oracle of Erpetology, having died without publishing his long expected work on Serpents, I am fortunate in possessing his last words of censure against those who, claiming high authority, make a chaotic confusion of species, and his exhortations to their successors to act otherwise. With his loss, however, we fortunately have not to regret the cessation of his most precious *Archiv für Naturgeschichte*, as Professor Erichson will devote himself with equal attention and diligence to that publication. And if the Memoirs of Nathusius on the *Sorices*, of Keyserling and Blasius on the *Vespertilionidæ*, of Krohn on the Metamorphoses and Generation of the *Sygnathi* and *Hippocampi*, and of Burmeister on the Corneous Integuments of the Tarsi of Passerine Birds, which furnish a good method for their classification, sufficed to raise that journal to great renown, the no less valuable labours of its present editor, which are there embodied, will equally maintain its reputation. This author is chiefly devoted to the *Invertebrata*, while in regard to *Vertebrata*, it will suffice to mention the valuable treatise of Wagner on the *Rodentia*. Müller and Henle, names which are inseparable, whether they treat of profound anatomical doctrines, or of the right determination of distinct species of Fish, have completed their work on the *Plagiostomi*, of which the second and concluding fasciculus, that which treats of the *Raiidæ*, yields in no respect to that on the *Squalidæ*, which has been so universally admired. Henle, moreover, has published independently an important Memoir on the Lingual Apparatus of Reptiles, compared anatomically. The posthumous work of Nitzsch, entitled *Pterologia*, is continued to be published, and unquestionably supplies new means for classifying

birds. The *Acta Naturæ Curiosorum* speak for themselves, as do the writings of the various professors of Bonn, and those of the celebrated Prince Maximilian of Wied, from whom we have, besides the descriptions of two most interesting species of *Rodentia*, two new species of North American birds, *Zonotrichia comata*, Wied, in the *Fringillinae*, and *Gymnorhinus cyanocephalus* in the *Garrulinae*, the last of which forms a distinct genus, to which I feel bound to propose the name of *Cyanocephalus* as generic, the name given by the author having been previously occupied.

Gloger has lately added to his many zoological works, an *European Ornithology*, deserving of high praise, of which we are expecting to receive the concluding volume. This author pushes, to an undue extent, the mania for restricting species, a useful but often dangerous tendency, and not unfrequently fallacious, an instance of which is furnished, among others, by the triumph of our countryman, Savi, respecting the *Sorex etruscus*, in which it were desirable that he had exercised more moderation. Directly opposed to Gloger, is the well known Brehm, who continues to multiply species *ad infinitum*, and not content with those which he has already created; he re-examines them daily, to extract from their ranks one or more new ones, a practice as you know already sufficiently exposed. The reader, however, who neglects to study this work, will deprive himself of many philosophical views, which indeed are not always able to emerge from the reality of facts without the aid of fancy. Whoever may have an opportunity of visiting Brehm, in his house, will admire a vast collection of birds, living and dead, in skeletons, models, and drawings. We might well say, that no one has studied the habits of birds more than Brehm, were it not for the Naumanns, which family for three generations has occupied itself with this curious and useful branch of natural history. So warm is their zeal, that they have constrained Nature, in order to procure and render familiar the winged tribes; one spot they have clothed with forests, another they have converted into a marsh; they have turned aside rivulets, and reared plantations of various foreign trees; not to mention the

new kinds of bird-lime, the new nets and the new cages, which they have invented and constructed. The present Naumann, after collecting and sifting the knowledge of his predecessors, and perfecting it by means of the growing light of the age, is now completing the last volume of a work, which excels all others of the same class, no less in the completeness of the text, than in the accuracy of the plates.

Proceeding to visit Northern Germany, we meet with Messrs. Blasius and Keyserling, who after having employed themselves on a Monograph of the European *Vespertilionidæ*, have undertaken to give a descriptive Catalogue of the *Vertebrata* of that portion of the world, a most useful task indeed, but of which I will not now speak in detail, as the questions on which I differ from those authors will be sufficiently elucidated when my work on the same subject is published. The descriptions of the *Mammalia* and *Birds* are already issued, and those of the *Reptiles* and *Fish* are anxiously expected. In Frankfort on the Main, Dr. Rüppell, now deserted by Professor Cretzschmaer, who seems to have bidden farewell to our science, has completed the ample volume of his *Fauna von Abyssinien*. We have also, from the same author, several monographs, one on *Céblepyris*, another on the Swans (among which he enumerates, to my surprise, the *Cairina moschata*), and he promises to publish others.

Southern Germany beholds new works published daily, but not of such importance, since the death of Spix, Wagler, and Michahelles. The supplements to the work of Schreibers on *Mammifers* are still continued. Besides the great work published at Darmstadt, I have received a periodical publication on the *Birds of Europe*, by Susemihl, which will now acquire fame, from the care bestowed on it by the celebrated Schlegel. There is also a treatise by F. Berge, on the *Propagation of Birds*, containing figures of their eggs. Some articles on *Zoology* occur in the *Journal of Dr. Rohatzsch*, published at Munich. The celebrated Tiedmann, by studying daily the brains of animals, and by weighing, measuring, and analyzing them in every way, has succeeded in distinguishing the species even when closely allied, more especially of the *Quadrumana*

and *Carnivora*, by the circumvolutions of the brain. He is now preparing to publish a magnificent work, with plates, representing particularly the brains of the *Felidæ*, from which we may expect some important principles for future researches on the Animal Kingdom.

At Vienna, Natterer having returned from a lengthened sojourn of sixteen years in Brazil, has brought with him, as is said, the largest collection of Brazilian Birds hitherto known, amounting to more than a thousand species; and we cannot therefore be sufficiently urgent, that he will soon decide on making them known. Nor has he confined himself to collecting Ornithology only, since we frequently see remarkable animals of other classes published, which are said to be the fruit of his expedition. Among these I will merely mention the famous *Lepidosiren*, the description of which he entrusted to Fitzinger, who, as well as Bischoff and others, believed it to be the last link of the Batrachians, although furnished with scales, whilst I, persuaded by the profound anatomical researches of Owen, do not hesitate to class it with Fishes.

Fitzinger, from whom we expect researches of still greater interest, continues to issue detached memoirs, which are always of value, such as that on Crocodiles in the *Annalen des Wiener Museums der Naturgeschichte*, a work which, I regret to say, is no longer published. In these Annals, the famous Heckel, the curator of the ichthyological portion of the Vienna Museum, and the inventor of a very useful instrument, which he calls an Ichthyometer, for the measurement of fish (which being thus defined by certain formulæ, may be drawn without seeing them), has published various memoirs which emulate each other in merit. He sent me several new genera, accurately defined, that I might include them in my writings on fish; and more recently, he has informed me of a new inhabitant of the fresh waters of eastern Europe, which he calls *Aulopyge*, most remarkable for having the anal fin perforated, and also for its affinity to the *Anableps* of South America.

• SWITZERLAND. •

AN humble cottage in Switzerland was the cradle of Scientific Congresses, which Italy now beholds in gilded marble saloons, thanks to the love of science which certain of her princes exhibit, on these occasions especially, as an example to others. It was there that these Congresses were founded by the worthy Gosse, whose accomplished son honours this meeting with his presence, and from them the celebrated Oken originated those of Germany, from which, rather than from the later Associations of France and Britain, you are well aware that our Congresses are modelled. The annual recurrence of these meetings in the Swiss Republic, proves abundantly, that no other country of the world includes so many men of science in so small an area. Another proof of it is to be found in the various collections of Academical Memoirs, among which the most distinguished in the present year are, the Transactions of the Helvetic Society, and the *Memoires de la Société des Sciences Naturelles de Neufchatel*. Neufchatel is a corner of the world, illuminated by the presence of an Agassiz; of that Agassiz, who, in the morning of his life, launched into such reputation, that the Academies of Rome, of Paris, of London, of Petersburg, of America, strove to enrol him among their members. He continues with success his great work on Fossil Fish, and has at last issued the first specimens of that other magnificent work on the Fresh-water Fish of Central Europe, the plates of which, illuminated in water colours, and silvered in a manner entirely new, surpass in truth and splendour every other work of a similar description. It was fortunate for him, that the British Congress preceded that of Turin (to which, as you are aware, he communicated a most important letter respecting Italian fossils), as he was well repaid with interesting observations made in richer regions, and in the fame which he earned, by proving that all the surface of the British Islands had once been covered with perpetual ice; although his fatiguing exertions and the rigour of the climate injured his health, so that being unfitted for profound study, and having

fallen into a nervous state, he reposed unwillingly for, some months. In the midst of this repose however, he employed himself usefully in compiling a universal Nomenclator of all the Genera of the Animal Kingdom, for which vast work he has collected more than 17,000 words, of which already more than 700 have proved to be used in duplicate. To render more perfect this well-conceived undertaking, he has resolved to submit the respective classes to those who are more especially devoted to one or other of them; and he has done me the honour of requesting my revision of the ornithological portion, in which he has already collected 1700 genera, to be followed by the Ichthyology which I have also in hand. I now exhibit to the section a slight specimen of this work. This learned naturalist intended to have spent the summer among the mountains in his vicinity, then to publish another part of his *Poiss-sons Fossiles*, and then to anticipate the arrival of this Congress, being desirous of first visiting with me the Maritime Alps; but the projects which he meditated were interrupted by the unfortunate episode of his illness. Under such a man who can doubt of the daily advancement of the Neufchatel Museum, patronised as it is by the patriotic feeling of those learned citizens, and assisted by M. Coulon? Geneva, that focus of civilization, is not confined to sheltering illustrious botanists; once the abode of the two Decandolles, of Duby, of Moricand, and others, she now boasts of a Pictet, who, not content with the fame which he acquired by the study of Insects, has now given us excellent illustrations of new *Vertebrata*, preserved in the flourishing museum of that city. The oriental plague in Syria has carried off Dr. Otth, the pride of Berne, where idly repose his collections and precious manuscripts, which, in a less turbulent and more studious city of Switzerland, would have been already published, as a rare treat to the cultivators of natural science. All Switzerland is peopled with active naturalists and adorned with museums. I will rest a moment at Zurich, where the Saxon, Oken, has his peaceful abode, and continues to edit the *Isis*, perhaps the most scientific journal of natural history, not in Germany merely, but in the whole world. He has lately finished his

great philosophical work on the whole of natural history, in which he has developed new and lofty theories, which, if to some they appear rather extravagant, are admitted by all to be most ingenious. There are none of us who do not regret the absence of a man to whom literature and science are so much indebted. Zurich may also boast of having given birth to that unwearied compiler, Professor Schinz, who has this year published a work on the *Vertebrata* of Europe, not indeed very well digested, and void of criticism, yet very useful, as containing every species, though they may be derived from books rather than from nature.

HOLLAND.

THE natural sciences flourish at present in Holland more than ever. This is shown by numerous publications, written, for the most part, in a language which is scarcely or not at all familiar to the generality; and by the prizes offered for the solution of certain questions, a specimen of which you have in the programme, which I now lay before you, of the Society of Science at Haarlem, a society to which I am proud to belong, and to be its representative on this occasion. The last volume of the Transactions of this Society, just now published, contains, among other papers, two, which, though foreign to Zoology, are of such importance, that I will here mention them, in order to make them known in Italy. One is by Herr Keitzing of Nordhausen, in Prussia, on the Metamorphoses of certain *Algæ*, and their development into plants of a higher organization; the other is by the celebrated Martius of Erlang, on the fecundation of vegetables. The richness of the museums of Holland has become proverbial, but they all are eclipsed by the national collection at Leyden, which, under the direction of a Temminck, aided by a Schlegel, a De Hahn, and a Reinwardt, has acquired a lustre, which equals, and even surpasses the most celebrated ones hitherto formed. Wonderful, above all; is the collection of skeletons, which is such, that no one can henceforth adequately treat of Zoosteology, without first having

recourse to this marvellous depository. In the court yards of this museum lives the gigantic American Salamandride, which in consequence of the decided opinion of those professors as to its being a true Salamander, it fell to my lot to call *Sieboldia*; a name which it has been afterwards vainly attempted to change into *Megalobatrachus*, and more recently (therefore less excusably) into *Cryptobranchus*; but I shall the more earnestly insist on the former appellation, because it commemorates the famous Dr. Siebold, who brought this Amphibian all the way from Japan, with other most interesting curiosities.

Temminck has concluded the series of his *Planches Coloriées*, forming a sequel to those of Buffon, and accompanied by an index which has hardly equalled expectation. He has also completed the fourth volume of his *Manuel d'Ornithologie*, which had been long expected, and in which is included a supplement to the preceding volumes, and a considerable number of species, either wholly unpublished, or new to the European fauna. A good work, on the Birds of this quarter of the globe, would have been much less imperiously wanted, if Temminck's *Manuel d'Ornithologie*, praised as it has been, especially in France, had been improved in its classification, its style, its arrangement of the descriptions (which, however, are very characteristic), and its notices of habits. The same naturalist has resumed, after a long interval, his very useful *Monographs of Mammalia*, among which the most anxiously expected was that intended to clear up the genus *Vespertilio*, more especially as the publication of his researches on these animals had been retarded more than twenty years. As long ago as 1830, I remarked in my *Osservazioni sulla seconda edizione del Regno Animale del Cuvier*, "I shall abstain from saying more on the Chiroptera (of America) to which I at one time gave my attention, but afterwards entrusted the specimens which I had collected to the learned Temminck, who is in a position to make a better use of them than I can do." We may therefore conclude, that he has devoted very little time to this subject during these twenty years, for notwithstanding his immense materials, and the aid which he has received from every side, the work would have afforded us but little light if

its defects had been less prominent. Permit me, therefore, to mention a few of these points, especially as it is an opinion which I have elsewhere maintained, that to correct the errors of eminent writers is the most effectual means to advance science, while the great veneration which is entertained for Temminck, and his *ex cathedra* tone, may in some cases prove fatal to truth. Not to enter on the discussion of classifications and the limitations of groups, which are matters of abstract opinion, I will here only remark upon *species*, which beyond all doubt, are matters of fact. His *Vespertilio brachyotus*, Bail., is nothing else than the *V. pipistrellus*. The *Vespertilio schreibersi* is perhaps the same with *Miniopterus ursinii* of my *Fauna Italica*, in the description of which he considered that the account of the teeth was wanting (of which, on the contrary, I gave a most minute description). This arose from his not knowing the proper place to seek it, for I having given these characters under the genus, could not repeat them under the species. The *Vespertilio limnophilus* published by him as new in Plate 48. of the work, is the *Vespertilio dasycnemus* of Boié. In regard to the two European species of *Plecotus* (a most excellent genus, notwithstanding his facetious remarks, now that it is restricted within due limits), he would have done much better to omit my *auritus* and my *brevimanus*, rather than the *auritus* and the *cornutus* of Faber, which are all one. It is true, that my *brevimanus* is different from that of Jenyns, which Temminck, with good reason, regards as the young of the *auritus*. He did not perceive, and I therefore announce it the more readily, that my *Vespertilio emarginatus*, of which he says my figure represents it exactly, is in fact the *V. nattereri*, which I have recently discovered 'also at Sestri. Possibly, there occurred to Temminck (whose figure is evidently copied from that of Geoffroy), that which I confess happened to myself, the failing to recognise the true *emarginatus* in the Paris Museum, where I made the strictest search in company with Isidore Geoffroy St. Hilaire, son of the founder of the species, which I would gladly have recovered, as the name of *emarginatus* ought to be retained for the species of Bat described by him. His

Vespertilio megapodius is evidently my *capaccinii*, of which I may add, that the *Vespertilio dasypus*, of the Turin Museum, is a synonyme. As I now wish to raise this species to the dignity of a genus, I shall call it *Capaccinius megapodius*, being ever desirous of honouring a most worthy prelate, whom I would gladly see sitting where he delights to sustain the honour of Roman learning, especially in our assemblies. The *Vespertilio humeralis* is not a good species, but only a variety of *mystacinus*. The *Vispistrellus* is nothing else than the *Vespertilio kuhli*. And here we may remark, that Savi will lose this as well as others of his species, as among Birds he loses his *Emberiza palustris*, which is identical with the *Emberiza pyrrhuloides* of Pallas. Another more magnificent and more recent work, which is also under the direction of Temminck, and does great honour to the typography and calchography of Holland, are the Illustrations of the island of Java; the last number of which contains a most interesting new genus of Marsupial. Schlegel continues his coloured representations of *Amphibia*, of which I have just received the fourth fasciculus, containing, among other things, the figures of many *Salamandridæ*, among which I rejoice to see figured the celebrated *Pleurodeles*, which I strongly recommended to the scalpel of our countryman, Rusconi, and which is accurately drawn with the very sharp ribs projecting beyond the skin. I cannot, however, abstain from expressing my regret, at seeing there repeated, among the Italian Salamanders, those words introduced equivocally, and now admitted to be erroneous, "*video meliora proboque, deteriora sequor*." It is superfluous to say, that in his own modern writings, Schlegel continues to increase that spirit of *ultra reunion*, which I need not have alluded to, if that fatal school had not invaded our own country. It is a mischievous inconsistency in his principles, that while restricting species, he yet multiplies their names, by giving a new term to the species which embraces the former ones; a fatality which persecutes Zoology! And to say the truth, the dazzling style of Schlegel, the confidence with which he lays down his own opinion, often indeed a just, and never a trifling one, frequently induce the reader to despise the object which he

attacks. This is not the place to bring forward the many errors of fact, contained in his fascinating chapter on the geographical distribution of the *Ophidia*, which I shall do on another occasion, with the respect which is due to such a man, and to so great a personal friend; who has now applied himself, and I see the announcement with joy, to a work on the *Cetacea*, which will certainly throw light on a subject, which notwithstanding the recent labours of F. Cuvier and of Lesson, is still very obscure.

BELGIUM.

TURNING towards Belgium, we find, that when she separated from Holland, she carried with her her due share of literary fame. My friend Cantraine, who was of such service to Temminck and to the Leyden Museum, now worthily occupies the chair of Natural History in the University of Ghent, and although he prefers the study of *Mollusca*, in which he has produced several descriptive and anatomical works, and is preparing others, he is also successfully occupied with *Vertebrata*; and among his other writings, has published an excellent Memoir on the Fish *Ruvettus* of Sicily and of Madeira. The *Memoires de l'Academie Royale des Sciences de Bruxelles*, afford us not a few papers of much value, among which I will notice a Monograph of the Dolphins with plates, a subject, as all know, that supplies a desideratum in science, very little being known of these fish-like animals so renowned in fable. This work we owe to M. Wesmael, who is also known for his entomological papers, especially that on the Instinct of Insects. The researches in Zoology and Comparative Anatomy by Wambeem, in the same Transactions, deserve honourable mention, though they relate principally to *Mollusca*.

The zoological labours of the active spirit of Dumertier are also well known, especially those on the crania of Orang-outangs, and the philosophical inductions which he draws from them. He only admits one species of these animals, notwithstanding the diversity in the cranium, which sometimes

exhibits a simple fronto-parieto-occipital crest, and sometimes presents it of enormous size and double. He shows, that the *Simia* resembles Man, in regard to its structure when young, and gradually becomes less human as it grows older, while Man, the older he grows, by the wisdom which he acquires, approaches always more and more to God. Science is also not a little indebted to another Belgian legislator, the active secretary of the Chamber, Baron Dubus, who has given us many descriptions of new species of Birds, and having now distributed them into decades, is about to publish figures of them. Anatomical researches on Man and Animals are daily extended by M. Burgraeve, whose anatomical and physiological museum attracts the admiration of strangers. The uninterrupted researches of the celebrated astronomer, Quetelet, on *Social Physics*, or in other words, the natural history of Man, including his circulation, physical development, &c., must not be forgotten, as they will lead to admirable results. But the most zealous and meritorious of the zoologists of Belgium, whence he diffuses his knowledge to more extended regions, is M. de Selys Longchamps, whose affability and learning the savants of Italy had an opportunity of appreciating at the Congress of Turin. Without speaking of his writings on the *Libellulæ*, which do not fall within our scope, I will commemorate his well known *Etudes de Micromammalogie*, which will throw so much light on the genera *Mus* and *Arvicola*, not to mention his Catalogue of the Mammifers of Europe. He is now extending his researches to the genus *Vespertilio*, and to the very intricate fresh-water Fish of his country, among which he describes thirty species of *Ciprinidæ*. I have lately received from him a valuable letter, in which he admirably establishes the differences between the much confused *Vespertilio nattereri*, *emarginatus*, *mystacinus*, *daubentonii*, and *dasygnemus*, for which he has laid down excellent characters; and he promises me perfect specimens, which I hope to receive in time to lay before this section, as he will be prevented from attending in person. All these undertakings are only a prelude to his greater work, the *Faune Belge*, which we are daily expecting. For the absence from this meeting of those

eminent Belgians, we are abundantly recompensed, by the presence of Professor Morren, whom we all esteem as excelling in many branches of natural science, an active promoter of useful discussions, and admirably chosen by his wise king and by the Academy of Brussels, to represent the science of that learned and industrious nation.

FRANCE.

It cannot be doubted, that France preserves her ancient scientific renown, notwithstanding the petulance of those who would wish to detract from it. Paris is ever the great centre of attraction, wherefore the attempts of those persons are most praiseworthy, who endeavour to transfer a portion of the light of science from this absorbing focus, to the rays and circumference of the circle, a tendency which we perceive in the annual Congresses, and in the recent establishment of the Provincial Institute, which now has its abode at Mans. There are founded also, in every region of France, new museums and schools, while the old ones are increased and adorned on every side. Bordeaux has, for many years, boasted of her Linnæan Society; she may now be proud of the "Actes" of that society, and of the museum lately entrusted to the care of Gachet. Marseilles daily enlarges her museum, and especially enriches it with specimens from Africa; thanks to the care of the indefatigable Barthélemy de la Pommeraye, who honours this meeting by representing his country, and who is the possessor of many new species, two of which, very interesting from their resemblance to their European congeners, I have described in the *Revue Zoologique*. Avignon too boasts, that amidst her turretted walls rises a museum, which, with many other philanthropic institutions, she owes to the care of her deserving citizen Requien. Arles, the birthplace of Laugier, the sharer of Temminck's labours, although it no longer possesses the celebrated collection which served as a groundwork for the *Planches Coloriées*, still retains a respectable museum, which is especially rich in the products of that French

Africa, *La Crau*. Nismes boasts not only of an interesting general collection, but a special one of the Ornithology of the Department of Gard. • Montpellier has not fallen from her ancient fame, and though in the branch of science which now concerns us, she has lost a Dugés, she yet contains several scientific men, including Professor Lallemand, whom we have seen amongst us, and from whom we have some valuable observations on the supposed spermatic Animalcules. Strasbourg, a city that shares in the advantages of France and of Germany, deservedly selected as the seat of the tenth scientific Congress of France, possesses a museum which has long been celebrated, as well for the professors which formerly adorned it, as for those which adorn it still, of whom we have an eminent example in our colleague M. Féc. Metz, happily situated on that Moselle, which was long since celebrated by the lyre of Ausonius, boasts of two faunæ in its department, one preferable to the other. Rochefort is the abode of Lesson, who is over influenced by that tendency of strong minds to attempt too much; and if we might express a wish in his behalf, it would be, that he might be enabled to appear to more advantage, by residing in cities better supplied with books and cabinets. His last work treats of Man and the *Simiæ*. The scientific journals are often adorned with his papers, or extracts from them. M. Allard, at Montbrisson, attracts the attention of naturalists, by his collection of the three kingdoms of nature, which receives daily additions and improvements. The nucleus of this collection, was that of Baron Feutrier, which still preserves objects possessed by the famous Buffon.

Not to be unduly prolix, I confine myself to Normandy, in which not only the ancient capital Rouen, but the learned city of Caen, and even the little Falaise, are decorated with Scientific Societies, Transactions, and Museums. That of Rouen is worthily presided over by Professor Pouchet, author of a Treatise on Botany, and of an equally valuable one on Zoology, of which the second and improved edition has been published in the present year; the only work hitherto in which the doctrines of his celebrated master, Blainville, are adequately developed. A devoted friend to this institution,

Pouchet, would have come amongst us three years since, had not a defect in his hearing induced him rather to await at his abode for the volumes of our Transactions. Caen has to boast of Professor Desjardins, of Brebisson, and of M. Caumont, the founder of Scientific Congresses in France. In Falaise resides the most practised ornithologist of France, the Baron de Lafresnaye, worthily connected with the family of Buffon. His classification, founded chiefly on the Habits of Birds, is the work which most particularly distinguishes him.

After the death of Cuvier, the sceptre of Zoology, which was disputed with him by Geoffroy St. Hilaire, passed into the hands of that family, which, in right of succession, is likely long to retain it. Paris will be indebted to the young Geoffroy for improved arrangements in her museums, which, in the ornithological branch especially, by no means equalled the expectation of excellence, which, in so great a metropolis, we were justified in entertaining. This eminent naturalist, far from being wearied with so many laborious and useful undertakings, is now preparing a work which will serve as a continuation to the great iconographic publication of his father and Frederic Cuvier, holding out to us also the prospect, at some future time, of a general *Species* of Mammifers.

I want words to praise, in adequate terms, the learned and magnificent work of M. Ducrotay de Blainville, another successful rival to Cuvier, which is the result of forty years of unwearied study. In truth, I know not whether most to praise the excellence of the descriptive portion, or the erudition which accompanies the history of science in each department. May we be allowed, however, to wish for a more rigid determination of species in this work? May we venture to say, that in order to avoid too great a multiplicity of genera, he forms some which are wholly inadmissible? It cannot be denied, that he is unacquainted with many species, especially of *Vespertilionidæ*. I may also add, that he has not weighed with much diligence, the characters of several of the genera which he has himself cancelled; such, for instance, as those which he incorporates with his *Subursus*, a word constructed to suit a theory, and certainly not an acceptable one. Among

his scholars, and among those who assist him, the most distinguished is M. Gervais, already well known by several useful memoirs.

The famous Professor Dumeril does not cease from his learned and successful studies. In compiling his universal *Species of Amphibia*, he entrusted a part of the labour to M. Bibron, who, it is only justice to say, has exceeded the expectation of all the cultivators of science, and especially that of his colleague. This distinguished young man, not honoured as yet with chairs or titles, nor enriched by well earned and profitable rewards, will ere long be esteemed one of the first zoologists of France. It is beautiful to observe how at every step of the publication of the *Erpetologie Générale*, the orders there treated of continually improve, as their arrangement proceeds in his hands at the *Jardin des Plantes*. These two naturalists are now turning their attention to Serpents, which will be comprised in two volumes; the publication of the *Batrachia*, which form the concluding volume of the work, being now anticipated.

I may here allude to that most useful undertaking of the publisher Roret (the worthy editor of the collection of *Manuels*), who under the title of *Suites à Buffon*, a name which carries great weight in France, like that of Calepinus in Italy, is publishing a series of excellent treatises on the different branches of natural history. I regret, that this is not the place to speak of those on the *Invertebrata*, and will only remark, that since the death of Desmarest, to whom he had entrusted the class of Fish, the selection of his successor will become a matter of general interest. Three plans would suit me if I were in the position of that editor:—First, to contrive by all means, that the work should be undertaken by Agassiz, who, it cannot be doubted, would render it novel and important in every aspect; secondly, that MM. Dumeril and Bibron, should apply to Fish the same energy and acumen which they have shown in treating of Reptiles, in which case every one might guarantee the value of their labours; or, thirdly, if neither of these two plans were practicable, to entrust it to the ichthyologist of the day, M. Valenciennes, even though

he should only give us a second and improved edition of that truly excellent work, which he had the honour to commence, in conjunction with the great master, Cuvier, and which he has now for some years continued alone. This work has now passed the fifteenth volume, and notwithstanding some slight defects, is undeniably beautiful and useful in every way, although the author finds himself tied down to the somewhat antiquated system of the before mentioned master. All the other writings of Valenciennes are equally to be praised, and especially the ichthyologic portion of the distinguished work of MM. Webb and Berthollet on the Canary Islands. To whom shall a chair be given if not to him? It were better for science had he been elected to the Chair of Ichthyology rather than of Malacology, a subject which he ever strives, and successfully, to overtake. The cultivators of science are themselves subject to malignant stars, and no one experienced them more than that estimable friend of Cuvier and Humboldt. Milne Edwards, the last fortunate rival of Valenciennes in the election to the Institute, is ever the chief zoological contributor to the *Annales des Sciences Naturelles*. He has published *Elémens de Zoologie*, but the lower animals seem more particularly to attract his studious inquiries.

M. A. D'Orbigny continues the fine zoological illustrations to his *Voyage dans l'Amerique Meridionale*, in which he has announced so many new species. His not less able brother, with other learned coadjutors, has undertaken a new *Dictionnaire d'Histoire Naturelle*, the two first volumes of which excite favourable hopes. I now lay before you some plates of this work, accurately coloured, by which you may judge of their inimitable high finish, although the work is of a popular nature and moderate price. There has also been published at Paris, a Supplement, rendered necessary by the lapse of time, to the great *Dictionnaire des Sciences Naturelles*, which the articles by Blainville suffice to render precious. The *Annales du Muséum d'Histoire Naturelle* are published from time to time, and are not unworthy of the great collection of memoirs to which they form a sequel. The *Revue Zoologique de la Société Cuvierienne*, edited by Guérin, has now acquired an

European fame and use, no less than the very comprehensive *Magazin de Zoologie* of the same author. The *Comptes Rendus de l'Institut*, the journal of the same name (*l'Institut*), which speaks not only of the French scientific bodies, but of those of the whole world, and the *Eco du Mond Savant*, are so many sonorous trumpets, which proclaim from Paris the progress of the natural sciences.

M. Bourjeaud de St. Hilaire has given us a new volume on Parrots, being a continuation of those of Le Vaillant, much inferior, indeed, to that of the English artist Lear, yet not wholly deprived of merit. The celebrated Mademoiselle Pauline de Courcelles, now Madame Knip, has commenced, with the literary aid of M. Florent Prevost, a writer not sufficiently active in following the rapidity of her pencil, a new series of Pigeons, not comprised in her former work, the text of which was written by M. Temminck, and of which a second edition is publishing at the same time, as appears by the prospectus which I have laid before you. I should never end, were I to enumerate all the zoological undertakings, and all the zoologists of eminence who adorn the French capital; I therefore take leave of them, briefly alluding to Prince Massena, whose rich zoological collections, we hope, will ere long be made public. The entomologists Dejean and Boisduval, Kiener, profoundly occupied with his *Iconographie des Coquilles*, the encyclopædic Bory de St. Vincent, who is now at the head of a scientific expedition, exploring Algiers (whence we may expect a work of not less interest than the magnificent ones on Egypt and the Morea, gained for science by the arms of France, or than those others which were the fruit of the various voyages round the world, of a Freycinet, a D'Urville, and others), do not permit me to leave Paris without at least mentioning their names.

What shall I say of Lyons? The ninth Scientific Congress of France, there assembled from the 1st to the 12th of the present month, and at which I proposed to myself the honour of attending, did not give me the opportunity of revisiting this illustrious city; but I was consoled, by reflecting how much the clergy of that and other dioceses abound with zealous

cultivators of natural science, and how the co-operation, and occasional presence, of that eminent Archbishop, the Cardinal Bonald, placed in the station of Albo, the first Honorary President, would add to the splendour of those meetings; in which it is daily becoming more fit that the ministers of the sanctuary should take an active part, inasmuch as they lead by a more or less direct path from visible to invisible wonders, and by the ministry of the first-born daughter of God they pay homage to the Maker and Founder of all things: But the volume of Transactions of that most numerous Congress, which is now in the press, will at once give a full account of the state of natural science, and of the ever increasing splendour of the scientific establishments of the second city of France. In what more particularly relates to Zoology, and especially to Vertebrata, the Abbé Croizet, who supplied to Cuvier, to Blainville, and others, so many fossils of his native Auvergne, and who is himself well acquainted with these objects, not only filled with much honour the office of President of the combined sections of Zoology, Botany and Mineralogy, but exhibited many objects of much interest and novelty, and occasionally entered into general discussions on the Animal Kingdom. In that city of Lyons, are the ornithological collections of M. Fleuret, which is very complete in Birds of Europe; that of Dr. Bifféri; and the fine one of M. Boursier, who was deputed by a Lyonesse Society to come here, and to whom we owe those fine photogenic drawings, admired in several sections, and well adapted to represent natural objects with ease and fidelity. In his collection are an abundance of rare species of Humming Birds, the new ones of which he has published in beautiful coloured plates, as you see in the specimens which I have presented in his name to the section. • Would that my prayers could induce him to publish the wished for Monograph of the gem-adorned family of *Trochilidae*, for which his collection, united with those of Loddiges and of Leadbeater, which he could easily visit in England, would suffice to supply him with all the materials hitherto known. If a person, who like myself, has given but little attention to this family, might venture to give him advice on the sub-division of these birds, it would be to recommend him

to attach much value to the colours, even more than to the form of the remiges and tail, in forming the various groups. The chief boast of that Congress, as he is of the chairs and city of Lyons, was M. Jourdan, founder of a museum possessing double merits. One of these is, that not being complete by nature, it is made so by the artifice which M. Jourdan has invented, of supplying the absence of the real object by the best figure to be obtained, and where this was wanting by the name. Thus, at a glance of the eye, one beholds the entire state of the Animal Kingdom, and at the same time one perceives what species are wanting to render the whole complete. The other merit of the collection consists in the arrangement according to the nervous system, which M. Jourdan considers the best for the whole kingdom, and for each of its classes. I who follow it in the case of the Mammifers, abstain from repeating the discussions which I held with that eminent professor, but confine myself to laying before you; at his request, an epitome, not only of this, but of the interesting psychological results which he deduces. He considers, that Animals should be classed according to their respective degrees of animation and sensibility. The circulation of the blood, respiration, digestion, generation, do not seem to him to correspond with the degrees which may be measured by means of the above mentioned faculties. The nervous system, on the other hand, is always developed in proportion to the sensibility, and on this, therefore, Jourdan takes his stand. The more abundantly animation is exhibited, the more extensive does the nervous synthesis appear. The fly, for instance, is more animated than the oyster, and thus the advocate of a single series of beings would see assigned to the *Articulata* that pre-eminence over the *Mollusca* which was denied to them by Cuvier? Just as vegetables and minerals have their sovereign characteristic law, so animals have theirs in *animation*, which shows itself by means of the sensations producible, in successive degrees, from the lowest Insect up to Man, who, combining them all, raises them to a yet more elevated point, so that Man, to adopt Jourdan's expression, is an *animal microcosm*. In the three lowest divisions of the Animal Kingdom, the sensations only

indicate instinct, that is to say, the spirit of self-preservation. In the fourth, will; or more correctly, intelligence, begins to develop itself. But in the fifth, composed of the human race, appear free-will, reflection, imagination, and above all, the spirit of perfection, which is not found in any other class. These progressive degrees are completely indicated by the greater or less development of the nervous system. A work on the comparative researches into that system, and which supplies rules for classification, was lately given me by Signor Bazin, entitled "*Del Sistema Nervoso, della vita Animale e della vita Vegetabile.*" These are subjects, on which, as all must see, an hasty opinion cannot be given.

SPAIN.

THE Spanish disturbances do not, as yet, permit that nation to employ itself successfully on studies which require peace and quiet. It is however known, that in certain provinces, especially in Catalonia, new museums are being erected, and that the Academies are beginning to flourish again, two of which, that of Madrid and of Barcelona, we have the pleasure to see here represented.

PORTUGAL.

PORTUGAL, of which I might repeat the above remark, has suffered, besides a great loss in the Prince Augustus of Leuchtenberg, the first husband of the Queen, an excellent friend and patron of the unfortunate Wagler. So great were his aims, and his noble intentions for the promotion of natural science, which he cultivated and loved beyond all others, as I could show to you by the epistolary correspondence with which my noble relation favoured me.

ITALY.

COMING to our own Italy, rich in so many branches of learning, that she need not be ashamed if in Zoology she is not equally advanced, we have chiefly to deplore the late irreparable loss of M. Camillo Ranzani, the Bolognese professor, and one of the first zoologists of Europe, who, a few days before his decease, wrote his last Memoir on the Fish of Brazil. There was no subject which he undertook which he did not penetrate deeply on every side. Oh! how much we have to regret, that he did not finish his *Elementi di Zoologia*, and especially the Erpetological and Malacological portions, of which subjects he had a perfect knowledge. Public opinion has already proclaimed, as his successor in the chair of Zoology, Professor Antonio Alessandrini, worthily called the Cuvier of Italy; and this appointment would be the more appropriate, because it seems reasonable to unite the chairs of Comparative Anatomy and Zoology, just as these subjects are united in our present section; whereas, there is little or no connection between Zoology and Mineralogy; both which professorships were held together by the deceased naturalist whom I have above extolled.

Signor Risso, encouraged by the warm and merited reception which he experienced at the Turin meeting, is devoting himself to fresh labours, with the additional experience which he has acquired, and is chiefly occupied with a monograph of the very intricate *Labridæ* of the Mediterranean. The magnificent ornithological collections of the Marchese Costa at Chambéry, a city devoted to natural history, increase perceptibly, as do those of the Marchese di Breme at Turin, and of Carlo Durazzo at Genoa; who, while pursuing his researches on the Ornithology of his own country, has this year enriched Europe with two new species, the *Podiceps longirostris* of Sardinia, which is wholly new, and the *Fulica cristata* of Spain, Barbary, Sardinia, and Liguria itself, resembling (at least in appearance), the one figured by Buffon as coming from

Madagascar, a point which remains for verification. It is certain, that by the inspection of Chinese drawings, we learn that this, or another *Fulica* equally crested, inhabits the waters of that region. Nor can we pass over in silence, the growing collections of the University of Genoa; nor the worthy professor who presides over it; nor the unrivalled entomologist, Massimiliano Spinola, whose capacious mind embraces at once the highest philosophy of the science, and the minute details of insects; nor the zealous naturalist Verany, founder of an interesting ornithological collection at Nice, a diligent designer of animals, and second to none in the knowledge of *Cephalopoda*. But in Turin, undoubtedly the most cultivated city of Italy, we need not wonder to see the three chief branches of natural history, respectively superintended by three men, equal in every virtue and talent, a Genè, a Moris, a Sismonda. The first of these, an eminent zoologist, though entirely devoted to editing the Transactions of the Turin Congress, has not wanted time or energy to continue his researches on the Animals of Sardinia, and to enrich the incomparable museum of which I was lately a witness, as well as to study the fresh-water fish of that kingdom, from which great results are promised for Ichthyology. Dr. Bellingeri ceases not to investigate the fecundity of animals; and the development of their intellect, from which researches he deduces many ingenious arguments.

Pavia preserves her ancient lustre, which is amply maintained by Rusconi, always intent on his profound studies, especially on the *Batrachia*, with which he alone has hitherto been dissatisfied; and which will open to us, I feel confident, a new field of knowledge, including the anatomy of the *Pleurodeles* which I discovered in that collection, where for fifty years it lay confused with the Tritons and Salamanders. And now the country of this distinguished man boasts also in respect to Zootomy, of a Panizza, who ever strives for the attainment of fame, formerly by means of medical and now by natural science, and whose advancement is likely to be aided by his ingenious scalpel which he generously dedicates to our instruction, of which his excellent Memoir on the Lamprey is a recent example. The rich collection of Serpents,

in that university, has been rendered more precious by the learned illustrations of them, undertaken by that active disciple of Schlegel, Dr. De Filippi, whose profound knowledge of anatomy, and of comparative physiology, seems to refute the too strong assertion of the Barbassori, that forty years of study, and grey hairs, are necessary to make an anatomist. Milan, which has been generously enriched with the Decristofori collection, so well intrusted to the care of Professor Balsamo Crivelli, is preparing herself to receive, in a suitable manner, the Italian Scientific Congress. And if Dr. De Filippi confines himself to the study of Vertebrate Animals, the city is more than compensated by her eminent students of Malacology, such as the noble Signor Carlo Porro, the able compiler of a classed bibliography of that subject; and of Entomology, such as the noble Signor Carlo Bassi, who from his very infancy gave token that his genius had happily led him to that branch of natural history, in which the serenity of his mind and of his style does honour to himself and to his country.

The Venetian provinces yield in nothing to those of Lombardy, there being one Institute of Science, which is divided in equal proportion between both regions. This is not the place to speak of many eminent men who compose it. In Venice, I will only mention the ornithological collections of Count Con tarini, who has made excellent observations on the Birds of that country. The many learned writings of Dr. Nardo, who is always engaged in completing his *Fauna Adriatica*, are familiar to you all, as tending to perfect, in every point of view, the natural system of Ichthyology. Verona has her scientific societies, and thanks to the prudent zeal of her citizens, she even has private parties so arranged as to be useful to science. The Italian Tyrol also boasts of her collections. Even from Chioggia the learned city of Padua attracted to her library Professor Naccari, who, if he has not yet joined this institution, has certainly the merit of having been the first to publish the Embryos of Faunæ in the form of catalogues, and who yields to none in zeal. Belluno, abounding in Birds, has produced a very useful ornithological synopsis;

and in a valuable work of the geological Professor Catullo, is a good list of the *Vertebrata* of that province.

Crossing the Adriatic, we see even the semi-barbarous Moldavia, establishing, under the patronage of her enlightened Hospodar, a natural history society, already rich in facts and specimens. Nor is this wonderful, in an age when the Tartar Emperor of China was enrolled in the register of the Academy of Brussels.

Athens, and the Ionian Islands, also nobly strive to cultivate the natural sciences in those countries. Malta has seen the publication of a good Catalogue of the Fish which live around her coasts; and that of the Birds, enriched with notes on their manners, is in preparation by Signor Antonio Schembri.

Sicily, more devoted to these sciences than the continental parts of the kingdom, beholds, on all sides, the growth of new societies, new journals, and new museums. You all know, gentlemen, the name and the activity of the *Accademia Gioenia* of Catania. Messina is distinguished among the Sicilian cities by Luigi Benoit and Anastasio Cocco. The latter continues to throw light, in every way, on the Fish of his own country, as is fully shown by his articles in periodical works, to which I may add the epistolary correspondence with which he obligingly honours me. Benoit has published the *Ornitologia Siciliana*, a truly useful little work, especially in Sicily, although it does not equal the expectations of those who looked for an original work on the Habits of Birds, rather than a repetition of other authors, who were frequently defective in points where it behoved him to have set them right.

Naples being the city in which the somewhat limited zoological science of the continental part of the kingdom seems to be concentrated, has lately beheld the formation of a society of young cultivators of natural science, which has already produced several useful works, and given promise of more. Dr. Oronzio Costa, its founder, who has undertaken a journey to Franco and Britain, has given us some new numbers of his *Fauna del Regno di Napoli*, so conveniently divided into monographs, which, if of but small interest as regards Mam-

mifera and Birds, is more important for the study of Fish, and especially of the lower animals. He has published, in various journals, articles on natural history, and particularly his *Corrispondenza Zoologica*. To him also we owe the knowledge of the most imperfect of the *Vertebrata*, the fish *Branchiotoma*, described a short time afterwards by Yarrell, in England, under the name of *Amphioxus*, which is deprived of the organ of smell and taste; not, however, of every trace of eyes and of brain, as erroneously supposed by some. In a recently established journal, the *Antologia di Scienze Naturali*, we note, with pleasure, the writings of Signor Piria, and of the equally well known Signor Archangelo Scacchi. Signor Dallo Chiaje, the continuer of Poli, adhering to his anatomical researches, has published the second volume of his complete physiological work, and an interesting Memoir on the *Proteus anguinus*.

Entering the Roman State, we find at Velletri an ornithological collection, the property of a lady, the Signora Contessa Borgia, who employs herself profitably with this science. Stopping too at Terracina, before arriving at this city, I may remark, that if the clear and cultivated intellect of an Elisabetta Fiorini were applied to Zoology rather than to Botany, in which branch she is famed among the highest masters of the science, I could with greater fitness exclaim with Ariosto:—

“ Le donne son venute in ecellenza
D'ogni bell' arte, in che hanno posto cura.”

In Rome, we have collections of natural history, not indeed despicable, but far from being proportionate to a city, which centuries ago boasted of the famous Kircherian Museum, or to the immense opportunities afforded by the Catholic Propaganda. These collections are daily enriched by the care of Professors Metaxa, father and son, of Dr. Ponzi, and of the indefatigable Signor Riccioli. We owe to the Metaxas an appropriate journal, where not only the medical sciences, but Zoology also has a place, by the publication of interesting memoirs which their zeal collects from all parts of Italy, with additional

materials of their own. Ichthyology, and especially its anatomical department, is illustrated by them in useful papers. The *Giornale Acadico*, the true foundation of which was laid in 1818, by a Lyncean Academy, now existing at Florence, includes many memoirs on natural science, which fell within the scope of its extensive range, unassisted at first by any public money. My own cabinet and my zoological library, which my subject obliges me to allude to, being now transported from the extremity of the Quirinal Hill to the centre of the city, may aid the student, by furnishing him with appropriate books and objects. You are acquainted with my own humble labours, which, by the aid of your intelligence, I shall endeavour to render always less unworthy of your compassion. It is right, that I pass an encomium on the rare collection of that zealous cultivator of science, Signor Lavinio Spada Medici, rich in minerals and crystals, and abounding in fossil bones, collected with much industry. With the death of the meritorious Cavaliere Abate Scarpellini, it is not right that the *Accademia dei Lincei*, which he restored, should also perish, when, by uniting it with another of great renown, through the care of the eminent Lambruschini, the Prefect of the Studies, and by the conspicuous zeal of the eminent Cardinal Giustini Camerlengo di Santa Chiesa, a zeal consistent not only with his personal character, but with the office which he sustains with equal dignity,—it will certainly not descend from the honourable rank in which it was placed by a Federico Cesi, with the aid of so many illustrious men, and especially of a Galileo.

Viterbo possesses the *Accademia degli Ardenti*, which is also concerned with science. Perugia sustains her ancient fame by the men whom she at present boasts of, and by the periodical works which she publishes. In natural history, she derives fame from a Bruschi, the founder of her Botanic Garden, and the author, besides other writings of the most classical work on Natural History that Italy has known; while the total privation of sight, which this learned man labours under, recalls the verse,—

“ Occhio cieco, divin raggio di mente!”

The venerable Colizzi is famed, not only for his voluminous work on Natural Law, but also for his profound knowledge of science, and especially of Chemistry. Besides her public collections, Perugia shows, with pride, the ornithological one of the Marchese Orazio Antinori. Ascoli deserves to be recorded for Orsini and his collections. The same may be said of Sinigagli, for Procaccini Ricci and his collection of fossils of every class, among which it most concerns us to mention the Fish. The Universities of Macerata, of Urbino, and of Ferrara, have also cause for boasting in regard to natural science. The learned Felsina, with her rich collections, her chairs from which such profound instruction is given, has her *Annali delle Scienze*, abounding with select matter, and her *Atti dell' Accademia*. I will only mention, not to be prolix, the excellent treatise of Professor Alessandrini on the Branchia of Fish, and especially that on the *Heterobranchus*, of which I am surprised that Valenciennes has not availed himself.

Modena, centre of the Italian Society, the birth place of an Amici, the abode of a Marianini, has beheld the publication of the first volume of the *Storia Naturale degli Stati Estensi*, by our colleague, Professor Brignole.

Parma, in whose praise it is sufficient to mention that second Esculapius, Professor Tommasini, an honour of which she has deprived our own Bologna (which boasted of having given him a chair), is also proud of Professor Jan, versed in all the branches of natural science, and long known for his researches made in combination with the zealous Decristofori.

Lucca offers some respectable collections in the royal palace of the Duke. The Zoological Museum of Pisa, in regard of the abundance and beauty of the preparations, and especially of the manner in which it is arranged, deserves to be cited as a model to Florence herself, if not to all Europe. This fine establishment is owing to the care of the truly zealous Paolo Savi, who forwards in every way the munificent views of his sovereign, and who every day strengthens his claims on the Grand Duke's liberality towards this institution, and on the gratitude not of Tuscany only but of all Italy. He is already sufficiently known to the scientific world for his extensive

knowledge of natural objects, and for the remarkable advancement which Zoology has received from him, by the aid of the two other sciences, which with rare success are united in him, Geology, namely, and Anatomy; as is shown by his numerous and highly praised writings, which are particularly remarkable for the clear ideas and correct judgment which distinguish him above others. Nor can I leave Pisa without praising its long established *Giornale de' Letterati*, which now, under a change of title, has become more dedicated to natural science, and in which we have lately perused an interesting Memoir by Pecchioli on the *Arvicolæ*. Sienna, renowned in Italian history, and even the commercial Leghorn, are provided with scientific establishments and with academies, with which the ever smiling Tuscany continually adorns herself.

It would be carrying flowers to the garden, were I to speak diffusely of this city of Florence, which now receives us with so much affection, generosity, and splendour, for you yourselves, with what I may call your *judicium subtile videndis artibus*, have been better able than myself to judge of the happy condition in which, amidst every other science, that of natural history luxuriates and fructifies abundantly; for which I should give renewed praise to the illustrious sovereign, were I not sure, that whatever fell from my lips would be inadequate to his deserts. I feel, however, that I should be justly blamed, if I omitted to say, that Leopold II., devoted as he is to the true progress of the highest studies, spares no anxiety to invite, and liberally entertain, the most eminent men of our common country; for he most wisely considers, that the interests of municipal protection are never to be preferred to the cause of truth and to the glory of the state. You have before you sufficient proof of the warmth of his zeal, not only for the details of science, but for those external matters which serve to embellish her. On the present occasion, he has spared no care to provide for the ornamental and scientific arrangement of the extensive museum in which we are now assembled. For this, a deserved tribute of praise must be given to the learned and modest director,* Cav. Vincenzo Antinori, ably seconded by the active curator, Signor Brus-

coli, and by Professors Mazzi, Nesti, and especially Dr. Carlo Passerini, whose accuracy in matters of science, is matched by that strictness of moral character in every social relation which we so rarely meet with.

You have seen with what liberality they have adorned with new and varied improvements this Botanic Garden, which by the active care of the excellent family of Targioni, has arrived at such perfection, and may rival any other in the abundance of species, through the assiduity of the agriculturist, Signor Baroni, who is so eminent for his theoretical and practical knowledge of Phytology. Thus to renew the vigour of scientific establishments, on occasion of these meetings, is certainly not the least of the infinite benefits arising from the institution of Congresses.

And from this third Italian meeting, which we are about to conclude in these revered and hospitable walls,—a meeting which, from the number and eminence of the visitors, has exceeded its predecessors in a flattering degree,—while we derive an ever increasing hope of the rapid advancement of our institution, we have also a fresh evidence, that to whatever honourable enterprise the Italians are summoned, they respond to the call, as they have always responded, when Patriotism attracts, unites, and warms them.

REPORTS
ON THE
PROGRESS OF ZOOLOGY,
FOR THE YEAR, 1842.

TRANSLATED FROM THE GERMAN,

BY
W. B. MACDONALD, B.A.
OF HAMMERSCALES.

MAMMALIA.

BY

PROFESSOR ANDR. WAGNER OF MÜNICH.

THE difficulty of presenting a succinct review of the various works, in this department of Science, is every year increasing.

North America, and the vast colonial empire of England, are daily assuming a more active participation in scientific research, and the mutual difficulty we experience of becoming completely conversant with the labours of each other, increases the labour of uniting, in one category, their published works with our own.* This difficulty becomes much greater, amounting sometimes even to impossibility, because the extra-European naturalists do not always employ our Terminology, though well adapted for accurate definition. A thorough acquaintance with "*Illiger's Prodrömus Systematis Mammalium et Avium additis terminis Zoographicis*," would be a great recommendation to them.

Even within the province of our own scientific culture, the difficulties are increased, of making ourselves master of zoological literature in its whole extent. The different dialects of the great empire in which the Teutonic tongue prevails, are

* For example, we have not yet succeeded in procuring, from England, after repeated attempts, the Calcutta Journal of Natural History; so that a notice of that work must be deferred till next Report.

striving with more and more energy to obtain an equal influence with those languages, which have hitherto held universal sway, both in the ordinary intercourse of life and in the scientific world; and although these national attempts in themselves may not invite us to much exertion in mastering them, yet, on the other hand, it is not to be denied, that they produce such important scientific labours, that he who would give a view of what has been done in Zoology could not omit noticing them, without leaving many gaps and errors in his sketch.

No one has suffered more from this difficulty than Lesson did, last year, in his "*Nouveau Tableau du Règne Animal; Mammifères.*" Paris, 1842, 8vo. This Tableau was designed to be a Catalogue of all the hitherto published species of Mammalia, and a similar one was promised on the Birds, Reptiles, Mollusca, and Zoophytes, the materials for which had been already collected. The former might have been looked upon as tolerably complete, if therological literature had been exhausted in French and English works; but as, besides these, there also exists a German, Dutch, Swedish, Danish, and American literature in Zoology,—the omission of so extensive a field, in the Tableau of Lesson, forms one of the principal obstacles to its completeness. The continuation of Schreber's Natural History of the Mammalia, since 1834; the treatises of Dutch zoologists on the Mammalia of the Indian Archipelago; whatever has been done for this class in Wiegmann's Archives, and by Nilsson, Brandt, and others, have all been entirely overlooked in this Tableau as if they had no existence. To these serious faults many others are to be added. First, there are great critical defects, and true and doubtful species, without selection, are arranged together in progressive numbers. Moreover, wherever Lesson has departed from the systematic arrangement of Cuvier, he gropea about in the dark. For example, he places in one family, *Ascomys* with *Cricetus*, *Gerbillus* with *Dipus*, *Hydromys* with *Castor*, *Hapalotis* with *Eriomys*, &c., evidently showing, that he is ignorant of their anatomical relations. Finally, we could not bring into use his new nomenclature of families, and partly of genera, without blushing for such a tyro in the

ancient languages; *Mastomonadelphie*, *Hydromastologie*, *Dipodineæ*, *Hippopotamisidæ*, *Rhinocerosidæ*, *Susidæ*, *Bovesidæ*, *Echymipora*, *Mysateles*, *Micoureus*, &c., are some of the numerous newly invented names, with which Lesson has the hardihood to display to the world his ignorance of the ancient tongues.

During the course of last year, the third division of the supplementary volume of Schreber's *Mammalia*, continued by A. Wagner, has been completed. The printing of this volume is just finished, but it will be still some time before it can be published. Of the *Rodentia*, the families *Pedimana*, *Sciurina*, *Myoxina*, *Macropoda*, *Chinchillina*, *Psammoryctina*, *Cunicularia*, and *Murina*, are fully described in it. The fourth division of the supplementary volume, which will soon appear, will contain the Terrestrial *Mammalia*.

The thirteenth volume of the *Mammalia*, in the Naturalist's Library, by Jardine, has been announced. It contains Col. C. H. Smith's Introduction to the *Mammalia*, but it has not yet come to hand. The twelfth volume, containing the *Equidæ*, merely mentioned in the former report, will this time be discussed in its proper place.

The *Histoire Naturelle des Mammifères*, by Geoffroy and Fr. Cuvier, the latter numbers of which have not yet been obtained, has terminated with the seventy-second.

Martin's *Natural History of Quadrupeds* has, unfortunately, since the third number, ceased to appear, in consequence of the bookseller's embarrassments.

The *Breeds of the Domestic Animals of the British Islands*, described by David Low, Professor of Agriculture in the University of Edinburgh, and illustrated with Plates, from drawings by Mr. W. Nicholson, reduced from a series of portraits from life, executed for the Agricultural Museum of the University of Edinburgh by Mr. N. Shiels. Lond. 1841-2, 4 vols. folio, price £16, 16s.

The first volume contains the Horse; the second the Bull; the third the Sheep and Goat; the fourth the Hog. These are the most sumptuous drawings of the domestic animals which have yet appeared. By

the aid of these beautifully drawn and faithful portraits, one can easily form a clear idea of the different English races of these animals.

Verzeichniss der in dem Museum der Senckenberg. naturf. Gesellschaft aufgestellten Sammlungen, 1st Abtheil: Säugthiere und deren Skelete. Frankf. 1842.

This Catalogue, prepared by Dr. Rüppell, is a voucher for those who cannot personally visit the Senckenberg Museum, that this magnificent institution can show one of the most remarkable collections of the Mammalia, both in stuffed specimens, as well as in skeletons and skulls. It is already known, that a great portion of this collection has been brought together by Rüppell's unwearrying activity.

It is much to be desired, that an index to the contents of all such great collections should be from time to time published.

We are also indebted to the same author for two excellent Treatises on Therology, in the third volume of the *Museum Senckenbergianum*. The first is on Mammalia, of the order *Rodentia*, observed in the north-east of Africa; and the second is a description of several New Mammalia, to be found in the Zoological Collection of the Natural History Society of Senckenberg. These two treatises will be more particularly discussed in the division of this Report appropriated to species.

Descriptions of some New Genera, and fifty unrecorded Species of Mammalia. By J. E. Gray. (*Ann. and Mag. of Nat. Hist.* x. p. 255).

A fair number of new species are here made known to us, but unfortunately in a very incomplete manner, frequently without mention of size, seldom with a comparison of them with known species, so that, in many cases, without specimens, it is impossible to make them out. Meanwhile, we shall only mention the names of Gray's new genera, which are as follows:—*Sturnira*, *Noctulinia*, *Trilatitus*, *Kerivoula*, *Myotis*, *Murina*, *Harpiocephalus*, *Centurio*, *Osmetectis*, *Nesokia*, *Vandeleuria*. Although these names are not so uncouth as those of Lesson, yet the most of them are sufficiently barbarous to debar their entrance into the system. Why should the rules of Linnæus, for nomenclature, which are to be found in his *Philosophia Botanica*, and repeated by Illiger in his *Prodromus*, not be generally recognised in England and France? This should be the express condition under which any new names ought to be received. Luckily, in the present case, most of the genera are of one character, so that they may be cashiered at the same time with their uncouth names.

Of the more general works on the internal structure of the Mammalia, the following may be mentioned:—

Osteographie, &c. Par M. Ducrotay de Blainville. Paris. Since 1840.

The tenth and eleventh are now added to the nine earlier numbers, the divisions comprising *Mustela* and *Viverra*.

Todd's Cyclopædia of Anatomy and Physiology. Lond. Since 1839.

Seven numbers of the third volume, parts 19-25, have appeared. Among the articles of its more general contents, may be here particularly mentioned—Mammalia by Owen, and Mammary Glands by S. Solly.

Neue Untersuchungen aus dem Gebiete der Anatomie und Physiologie. Von F. J. C. Mayer. Bonn, 1842.

The Essays pertaining to our Report, are,—1. The *Bursa Pharyngea* of the Mammalia: 2. The Anatomy of the *Marsupialia*: 3. A Peculiar Organ in the Tongue of Man and the Mammalia: 4. A peculiarity in the Structure of the Tongue of the Armadillo. Nos. 2 and 4, will afterwards be more particularly mentioned.

Nasmyth has laid before the Paris Academy, an Essay on the Microscopic Formation of the Teeth (Compt. Rend. xv. p. 678); on which Dutrochet, Flourens, and Serres, have given in a report. (Ibid. p. 1055).

The authors of this report agree with Nasmyth, that the (cartilaginous) fundamental substance of the ivory, and the enamel of the teeth, is composed of cells; on the other hand, they differ from him with regard to the tubes, said to bear calcareous matter in the substance of the ivory, and which he considers as fibres, while they have convinced themselves of the correctness of previous observations. On the external surface of the enamel, Nasmyth observed a tender cuticle, which the reporters also discovered and recognised as a cellular formation. This is, perhaps, the same membrane which Erdl described in the Munich Gel. Anz. xv. p. 771, as the commencement of caries.

Traité pratique et theorique d'Anatomie Comparative comprenant l'art de disséquer les animaux de toutes les classes et les moyens de conserver les pièces anatomiques. Par H. Straus-Durkheim. Paris, 1842, 2 vols.

The animal structure is not merely described in this book, in a clear and comprehensive style, but the manner in which preparations can best be made and most durably preserved is also pointed out. In the latter

respect, it may be consulted with advantage by the curators of zoological collections. The classification of the animal kingdom is copiously treated of in the introduction.

Årsberättelser om nyare Zoologiska Arbeten och Upptäckter, till K. Vetenskaps-Academiens afgifne för åren 1837–1840. Af C. J. Sundewall. Stockh. 1841.

This arrived too late for review in my last year's report; but I agree completely with the judgment of the editor of our Archives upon this solid work, and which he has appended in a note to my report. I am surprised, however, that my continuations of Schreber's Mammalia seem only known to the author, from a notice of them in the Isis and in the Archives. It is a great pity, that the language in which this excellent review is written, should be a hindrance to its general circulation.

Osservazioni sullo stato della Zoologia in Europa, in quanto ai Vertebrati nell' anno 1840–1841, lette li 27 Settembre, 1841, alla terza riunione degli Scienziati Italiani da C. L. Principe Bonaparte. Firenze, 1842.

An excellently written review, and very complete, so far as Italy, France, and England, are concerned, of the works which have appeared on Vertebrated Animals during the year 1840–41. German contributions are less noticed and known. A *Pterologia*, for example, is composed from the *Pterylograpia* of Nitzsch. According to the Prince, the Acts of the *Naturæ Curiosorum* are quoted as "*gli Scritti dei vari Professori di Bonn*," a misconception, probably arising from the *Acta Naturæ Curiosorum* being published at Bonn. A compliment is paid to Southern Germany, that it sees new works daily appearing; but then follows this dubious addition, that these works are of less importance since the death of Spix, Wagler, and Michaelles. The Mammalia of Schreibers (*i. e.* Schreber) is also praised. A work upon European Birds, besides the great one at Darmstadt, he proceeds to mention, as published by Susemihl (*i. e.* Susemihl); another by Berge, on the Propagation of Birds; some zoological articles which have appeared in the Journal of Dr. Rohatsch; and that Dr. Tiedemann still continues busy, weighing, measuring, and dissecting various brains. These the author supposes to be the contributions of Southern Germany. Of Holland, he speaks with praise, that natural historians are more abundant there than formerly; and it is rather curious, that neither Vrolik, nor Schröder van der Kolk, nor S. Müller, although the principal contributors of treatises on that subject, nor Van der Hoeven, although editor of a periodical on Natural History, are mentioned at all, probably because their works are written in "*quel idioma poco o nulla familiare all' universale*." Temminck's Monograph

on *Vespertilio* is strictly criticised, so far as concerns the European species, and some mistakes which had slipped into it are corrected; however, the reviewer has on this occasion forgotten, that these corrections were already made by Keyserling and Blasius, in our Archives, two years previously. Notwithstanding these little criticisms, we hail with pleasure the continuance of this annual report, as by its means we become more readily and perfectly acquainted with Italian contributions to science; and we have only to express a wish, that the celebrated author may fill up omissions, by the aid of our Archives, which otherways might occur in the sketch of German literature.

Amtlicher Bericht über die 19te. Versammlung deutscher Naturforscher und Ärzte zu Braunschweig im September, 1841. Von F. K. v Strombeck u. Dr. Mansfield. Braunschw. 1842.

Much richer in regard to Zoology than that of last year, as Blasius has given a brief account of a great portion of the results of his Russian Journey.

Atti della terza riunione degli Scienziati Italiani tenuta in Firenze nel Settembre, 1841. Firenz. 1841.

The zoological portion has been briefly noticed in the Isis; whence it is clear, that much that is interesting had been brought forward.

No reports of the Transactions of British and Scandinavian Naturalists have yet reached me, so that I must here leave a gap. These Societies, if they had any anxiety that their Transactions should early become known to us, might lessen the trouble of editing, if they themselves would timeously forward their Reports, or, at least, send them over to the Academies.

Verhandlungen der schweizerischen naturforschenden Gesellschaft bei ihren Versammlungen zu Zürich den 2, 3, und 4. August, 1841. Zürich, 1842.

In the introductory discourse by Schinz, some interesting statements are made of the condition of Scientific Institutions in Switzerland, which furnish an obvious proof of what great progress can be made in this department, when the work is set to with will and energy. In the formation of large collections, Geneva, Neuenburg, Zürich, Basle, Berne, and Aargau, have especially taken the lead. Lucerne and Freiburg have shown a preference for other objects.

The history of the Fauna of individual countries has made rapid advancement in the past year, both by writings peculiar to the subject and by books of Travels.

H. Freyer, Fauna der in Krain bekannten Säugthiere, Vögel, Reptilien und Fische; nach Cuvier's System geordnet, etc. Laibach, 1842.

I have not yet received this Fauna, although ordered, owing most probably to the difficulty of intercourse between the Leipsic booksellers and those of the provincial towns of Austria.

Landbek's Beiträge zur Zoologischen Geographie, die Säugthiere Siebenbürgens. (Isis, 1842, p. 176).

A very grateful contribution to Animal Geography, as we have hitherto known almost nothing of the Fauna of Siebenbürgen, although the variety of its physical relations led us to expect much that is remarkable with regard to it. Amongst those species more deserving of notice, I may here quote, *Ursus arctos*, *Felis lynx*, *Castor fiber*, *Arctomys Bobac* or *Marmotta*, *Lepus variabilis*, *Antilope rupicapra*, *Capra ibex*, almost extirpated. In all, fifty species are described.

Faune Belge, 1re Partie: indication Méthodique des Mammifères, Oiseaux, Reptiles et Poissons observés jusqu'ici en Belgique, par Edm. de Selys Longchamps: Liège, 1842.

Besides eleven species of Domestic Animals, the author enumerates sixty-three species of Mammalia for Belgium. Among these he reckons the Human as one, and after it immediately follows the Badger. That the author has felt the unfitness of such an arrangement is evident, from his attempting a sort of apology for it. 310 species of Birds are mentioned as being found in Belgium.

As the making out of these Faunas rests upon numerous personal observations, this work may be regarded as a highly valuable contribution to the knowledge of European species and their geographical distribution.

Bonaparte, Iconografia della Fauna Italiana. Tom. 1. Mammiferi et Uccelli. Roma, 1832-41.

The conclusion of this beautiful work has now reached us. Of the ninety species of Mammalia which the author ascribes to Italy, forty-four are here represented; and of 390 species of Birds, thirty-five. This Iconografia is the most important contribution to the knowledge of the remarkable Fauna of the basin of the Mediterranean; and the Prince has gained not less merit by its publication, than he did by that of the North American Fauna.

Travels in Kashmir, Ladak, Iscardo, the countries adjoining the Mountain Course of the Indus, and the Himalaya north of the Panjab, by G. T. Vigne. In 2 vols: Lond. 1842.

These travels may be regarded, in some measure, as the continuation of a work written two years before,—“A Personal Narrative of a Visit to Ghuzni, Kabul, and Affghanistan.” The author is the first European who has penetrated to Iscardo, the metropolis of Lesser Tibet. Without possessing a systematic knowledge of Zoology, he has, as a dilettanti and sportsman, principally paid attention to the Game Animals of these countries, and imparted much valuable information regarding them. The portions of wild sheep and goats brought back by him were identified by Blyth.

Cabool: being a personal Narrative of a Journey to, and Residence in that City, in the Years 1830, 1837–8, by the late Lieut.-Col. A. Burnes. Lond. 1842.

The author, who is well known by his Journey to Buchara, and his melancholy death at Kabul, gives, in his description of that place, a short notice of the animals (p. 162), which is very worthy of attention, although defective in scientific distinctions. The waterfowl are there very numerous, as Burnes says he collected no less than forty-five different species of Ducks (meaning web-footed birds). Animals with fur fit for use, are much in request; of these, from eight to ten species were found,—amongst them, the Lynx, “*Gor-kun*,” and the “*Moosh-Kkoorma*,” but one of the most prized is the “*Dila Khaufuk*,” a large Weasel, of greyish colour, with white on the neck. The “*Galago crassicaudatus*” of Cuvier (surely erroneously identified) was also found by the author, as well as the Huzara Rat, a creature without a tail (probably a *Lagomys*). Porcupines and Hedgehogs are there in abundance; Marmots are also caught, but Hares are rare and small. With the exception of waterfowl, there is very little game, though the Affghans hunt every thing that has fur. Bears of a reddish-brown hue, and Wolves are seen in winter; also the Red Fox and the Common Fox (Reynard), which is larger than in India. The people also talk much of the “*Sug i Kohee*,” Hill-Hound of Huzara, but the author doubts if it actually be the Wild Dog, as there are neither woods nor jungles. There is also another animal, similar to our Badger, and called “*Tibbergam*.” Some pretty specimens of wild Sheep and Goats were brought from Hindu Kusch; these have been tolerably circumstantially described by Dr. Lord, in Appendix, No. V.

The Expedition to China is already beginning to bear fruits in Natural History. Th. Cantor has produced an Essay, “General Features of Chusan, with Remarks on the Flora and Fauna of that Island.” (Ann. of Nat. Hist. ix. p. 265).

Cunningham mentions, as far back as the year 1701, that Chusan abounded in Cows, Buffaloes, Goats, Stags, and Swine. The Stags have

now wholly disappeared with the woods, and the over-peopling of the island has done away with the large domestic animals. The few Oxen which were found on the first occupation of the island were merely used for husbandry; but there were neither Buffaloes nor Sheep, which latter (of a broad tailed species) were very numerous in China. Several skins of the *Manis pentadactyla* were seen, which must have been the product of the island. Two specimens of the *Cervus axis* were brought from Formosa.

Souvenirs d'un Voyage dans l'Inde executé de 1834 à 1839, par M. Adolphe Delessert. Paris, 1843. 8vo.

This work is divided into a description of his Travels and a Zoological Appendix. The first seems merely intended for the information of the author's private friends, and contains no scientific information. His longest stay was at Pondicherry, whence he undertook many hunting expeditions to the Nilgherries, and made a large collection, which contains no less than 1200 specimens of Mammalia. The Appendix stretches over all the chief divisions of Zoology, and is furnished with beautiful plates, six of which belong to Therology:—Tab. 1. *Bos frontalis*: 2. *Canis primævus*: 3. *Sciurus Delessertii*: 4. Skull of *Sciurus Delessertii* and *insignis*: 5. Skull of *Sc. Rafflesii*: and 6. Skull of *Sc. auriventer*.

Verhandeligen over de Natuurl: geschiedenis, &c. Zoologie. No. 7. Leid: 1842.

The seventh number of this publication falls to be mentioned, which is accompanied with eight plates,—“*Simnopithecus sumatranus*, *Rhinoceros sondaicus* and *sumatranus*, *Bos sondaicus*, *Cervus Kuhlî*,” skull and horns of “*Cervus russa*, *Russa moluccensis*, *Russa timoriensis*, *equinus* and *Kuhlî*,” of Birds—“*Buceros cassidix*.” Very beautiful and correct plates, which show that the work is making good progress; so that it would be much to be lamented, if, as the prospectus holds out, it should soon come to a conclusion, just as a commencement has been made to represent the zoological relations of the Colonies of the Netherlands. The very great expense at which this work, by distinguished naturalists, has been begun, makes continued elaboration in the same scale necessary; and, for the interest of science, we hope that the enlightened Government of Holland, which encourages in the strongest way every scientific aim, will afford to this work, one of the most important in our department, the means of completion. In this way, they will erect such a monument in the history of the sciences as few nations can exhibit.

Fauna Japonica, sive descriptio animalium, quæ in itinere per Japonicam, jussu et auspiciis superiorum, &c. Suscepto,

annis, 1823–30 collegit, notis, observat. et adumbrat. illustravit Ph. Fr. de Siebold. Mammalia elaborantibus C. J. Temminck et H. Schlegel. Lugd. Batav. 1842. Decas. 1.

This also is one of the most important works, which, by the munificence of the Government of Holland, have been contributed to science; and, at the same time, affords a happy proof how scientific zeal can set aside the barriers which Japanese mistrust has opposed to the entrance of European elements. In the first Number, the following species are described:—“*Inuus speciosus*, tab. 1 and 2. *Pteropus dasymallus*, *Pt. pselaphon*, *Rhinolophus nippon*, tab. 3, fig. 1, 2. *Rh. cornutus*, tab. 3, fig. 3 and 4. *Vespertilio molossus*, tab. 3, fig. 5. *V. noctula*, *V. blepotis*, *V. macrodactylus*, *V. abramus*, *V. akakomuli*, *Talpa Wogura*, tab. 4, fig. 1–5. *Urotrichus talpoides*, tab. 4, fig. 6–11. *Sorex platycephalus*, tab. 5, fig. 1.” Besides these, there are figured:—“*Sorex indicus* and *Kinezumi*, tab. 5, fig. 2, 3. *Meles anakuma*, tab. 6. *Mustela natsi* and *melampus*, tab. 7. *Nycthereutes viverrinus*, tab. 8. *Canis hodophilax*, tab. 9. *C. familiaris japonicus*, tab. 10.”

In the Mus. Senckenb. iii. p. 115, Dr. Rüppell has given a view of the geographical distribution of the *Rodentia*, collected by him in the north-east of Africa and the coasts of the Red Sea. Thirty-five species are enumerated in all.

Two new numbers, the 15th and 16th, of A. Smith's Illustrations, have arrived. It is a pity this beautiful undertaking does not advance quicker.

The fourth number of Harris's Portraits of the Game and Wild Animals of Southern Africa has appeared, with tab. 19. *Rhinoceros simus*: 20. *Strepsiceros capensis*: 21. *Gazella albifrons*: 22. *Elephas africanus*: 23. *Aegoceros niger*: 24. *Equus montanus* (*E. zebra*, Lin.) and *Oreotragus saltratrix*. The plates rival those of the former numbers in beauty and splendour.

Reise in das innere Nord Amerikas in den Jahren, 1832 bis 1834. Von Maximilian Prinz zu Wied. Coblenz, seit, 1838..

This work has now come to a conclusion, and will take its position amongst the most important contributions to the literature of travels.

A Catalogue of the Mammalia of Connecticut, arranged according to their Natural Families. By J. H. Linsley (Sillim. Am. Journ. xliii. No. 2, p. 345).

It is very fortunate, that individual Faunas are every day occupying more attention, because, in this way, the most certain materials are brought together for a General Animal Geography. Linsley enume-

rates seventy-one species for Connecticut, in which, however, the usual domestic animals, and seven species of Whales, are included.

Buchanan has contributed very extensively to the knowledge of North American Mammalia, in the *Journal of the Academy of Natural Science of Philadelphia*, viii. 1 (1839); 2 (1842), mention of which will afterwards be made in the course of this Report.

In the *Compt. Rend. des Séances de l'Academ: des Sc.* xv. p. 1045, Is. Geoffroy has furnished a report on Castlenau's Journey in Florida, from which much that is valuable may be expected on the Fauna of that province. As the procuring of zoological literature is every day becoming more expensive, it is much to be desired, that if possible, pictures of costumes and customs, picturesque views, and figures of all those species of animals which have already been drawn, were omitted, and merely the new and interesting species given. If, on the one hand, it is to be most thankfully acknowledged, that the French Government, annually, either directly contributes very considerable sums for editing costly works (in the course of the year more than 400,000 francs), or subscribe for from 100 to 150 copies; yet, on the other hand, the author is thus tempted to publish his work, in a style which adds quite unnecessarily to the cost, and increases the difficulty of procuring it in a foreign country.

Diagnosen neuer Arten Brasilischer Säugthiere. Von. A. Wagner (in these Archives, eighth year, 1 vol. p. 356).

In conjunction with Mr. J. Natterer, I have been engaged on the Mammalia of Brazil, for which, by his persevering energy, materials have been brought together in Vienna, such as no other collection can exhibit. It is confidently to be hoped, that the Supreme Austrian Government will extend the same support to this work which other states lend to similar undertakings. A beginning is here made to the publishing of a general Fauna of Brazil, to which Austrian Naturalists have given preparatory aid; and, in the meanwhile, I have selected twenty-seven new species of Mammalia, whose diagnoses I have made known.

Journals of two Expeditions of Discovery in North-west and Western Australia, during the years 1837, 38, and 39. By G. Gray, Governor of South Australia. London 1841, 2 vols. 8vo.

A very instructive journey, made through a portion of New Holland hitherto very little or not at all known. As the author remarks, North-west Australia seems particularly rich in Birds, Reptiles, and Insects; of Mammalia there are but few species, and even these are limited in numbers. During a five months' residence, Gray found only four species

of Kangaroos, namely,—*Halmaturus giganteus*; two smaller species, of which *Petrogale brachyotis* is one, and a Kangaroo Rat. Also a sort of *Opossum*, as he calls it, or a Flying Marsupial; two species of Dogs, one of which agrees with that of Timor; besides Rats and Mice. He twice followed the track of an animal with cleft hoofs, whose size, judging from the footsteps, must have exceeded that of the Buffalo. Gray mentions an unknown domestic animal, which perhaps might have been a Cow, escaped from some earlier expedition. In the appendix are found contributions to the knowledge of the geographical distribution of the Australian Mammalia, with notices upon some newly discovered species (already mentioned in the Archives, 1842, p. 339). Gould has added a list of Birds, comprising 182 species.

A more general index of the contributions to the knowledge of the remains of antediluvian Mammalia must be mentioned at a future period.

Sur les Cavernes et les Brèches à Ossements des Environs de Paris. Par M. J. Desnoyers. (Compt. Rend. xv. p. 522, with a note in the "Annal. des Sc. Geolog. 1842.")

Cuvier had to undertake his first labours on the fossil cavernous animals, chiefly from materials collected in Germany. A considerable period elapsed till similar bone caverns were discovered in the South of France; and ten years after the death of that great naturalist, Desnoyers, along with C. Prevost, collected a great many of such remains in the immediate neighbourhood of Paris. They found them in excavations of Gypsum (*Gipseschloten*), of which one at Montmorency, a few mètres in width, alone contained more than 2000 bones of more than 300 individuals, and of about twenty species, generally of great size. The list enumerates the following genera:—1. Shrew-mouse, two species, of which one resembles the *Sorex tetragonurus*, the other the *S. fodiens* (very abundant): 2. Mole, of the common species (abundant): 3-6. Badger, Weasel, Polecat, Martin, not differing from those of the present day (few): 7. Field-mouse, of 4-5 species (most abundant): 8. Marmot, not differing from those of the present day (pretty common): 9. *Spermophilus*, agreeing with *Sp. superciliosus* of Kaup: 10. Hare, bigger than the common one: 11. Lagomys, two species (rather few): 12. Wild Swine, teeth (few): 13. Horse (abundant): 14. Reindeer (antlers and bones): 15. Stag, of a small species. Along with these remains of Mammalia, were found some bones of Birds, very like those of the Common Land Rail; besides some small *Batrachia* of the size of a Frog, and several species of *Helix* and *Pupa*. Some time afterwards, to the south of Paris, at Corbril, a cavern was discovered in sandstone, containing bones of the Elephant, Rhinoceros, Hyæna, Cavern-Bear, Horse, Ox, and an antlered ruminating animal.

Sur des nouvelles Cavernes à Ossements de l'Aude. Par M. Marcel de Serres (Institut. 1842, p. 388).

These caverns are found in the neighbourhood of Carcassone (Aude), at the little town of Caunes, in transition limestone, which furnishes the finest marble in the South of France. There has hitherto been discovered,—1. *Equus*, most abundant; out of some small bones, M. de Serres might describe a second smaller species: 2. *Cervus*, abundant, of small stature: 3. *Capreolus*, identified by the teeth: 4. Antelope, among which will be distinguished the *Chamots*: 5. *Capra cægagrus*, “a species easily distinguished by its hack teeth” (?): 6. *Bos intermedius*: 7. *Lepus*, tolerably abundant: 8. *Ursus*, numerous, but the portions were not so complete as to render the species recognisable: 9. *Canis*, partly agreeing with the Household Dog, partly with the Fox: 10. *Hyæna spelæa*, not abundant: 11. *Felis*, classed by the author, from the remains, partly with the *F. leopardus* and *F. serval*. Among the bones of Birds were recognised an Owl, Buzzard, and Quail.

Lund has imparted the newest discoveries of his continued investigation into the Brazilian Caverns, containing the bones of buried antediluvian Mammalia.

These are to be found in a treatise, dated Logoa Santa, 30th January, 1841, which is epitomized in the “Oversigt over det k. danske Videnskubernes Selskabs Forhandling i Aaret, 1841, af Ørsted. Kiöbenh., 1842, p. 16.” Lund has discovered, up to this time, 111 species, divided into fifty-four genera, whilst the living Mammalia of the same country, only amount to eighty-nine species, belonging to forty-nine genera. Among the most important of the newly discovered fossil species are,—two species of ant-eaters, very like the *Myrmecophaga jubata*, and *tetradactyla*; two species of *Dasypus*, Wagl., one of which is of the size of the *Tatu mirim*, the other (*D. sulcatus*) somewhat bigger than *D. punctatus*: a dwarfish species of *Megatherium*, somewhat larger than the Tapir (*Megatherium Laurillardi*): a new genus of the family of the Sloths, distinguished by its large canine teeth, like those of the *Cholepus* (*Oenotherium gigas*); and, lastly, the Otter, a species not hitherto discovered among antediluvian remains.

Among the corrections of his earlier labours, the most important is, in regard to his former statement about the occurrence of the Hyæna—more complete remains have convinced him, that they belong to a genus between the dog and cat; he names it *Smilodon*, on account of its firmly compressed almost lancet formed canine teeth. This animal was of the size of the lion, but of a heavier structure, and its canine teeth exceed, in size, those of all hitherto known beasts of prey.

Lund gives a very ample description of the *Platyonyx*. He places

this genus next the Sloths, with the remark, that it is organized on the plan both of the *Megalonyx* and *Megatherium*, and that, on this account, its place among the Sloths appears incorrect, as the primitive genera were covered with a coat of mail. The question, whether the human bones, found with the antediluvian remains of animals, may be of the same age, Lund thinks it at present impossible to answer with any degree of certainty.

Human Footprints in Solid Limestone. By Dav. Dale Owen, M.D. (Sillim. Americ. Journ. 1842, xliii. No. 1, p. 14).

When I recognised in the plate accompanying this paper footsteps, undoubtedly human, I entered on the perusal of it with caution, and the more so, when it appeared that the author was also the possessor of the specimen, for he, in common with us all, would naturally lean towards a theory that gave additional value and interest to it. My fears were, however, groundless. Dr. Owen explains these footsteps to be the works of the idle Indians, in opposition to the opinion of Shoolcroft and Mantell, who had considered them to be those of the antediluvians. Owen's explanation is doubtless equally applicable to the human steps on the Zauberge, northward of Athens-Georgia. (Inst. 1842, p. 140). That they are not those of man may be confidently asserted, when we learn that this limestone belongs to a formation older than the coal. I am of opinion, that in general, animal traces of this kind in rocks will be found to have some similar origin to those described by Dr. Owen; but that this is not the case with respect to the impressions on the sandstone slabs of *Hildburghausen*, I am equally persuaded. A personal inspection of these slabs, during the last summer, has satisfied me, that the tracks have been made by an animal; as truly as those are in the *Weilheimer Lime-tophus*, which I had already discovered two years previously, and concluded to be made by the impressions left from the tread of stags. From what animal the *Hildburghausen* tracks have had their origin, I am at a loss to say, for I am not sure even of its class; but analogy may lead us to conclude that it was a reptile. Similar prints have lately been found, in variegated sandstone, at Aura on the Saul (*Unterfranken*). Rumpf in Jahrb. f. Min. 1842, p. 450.

QUADRUMANA.

RECHERCHES d'Anatomie Comparée sur le Chimpanzé, par W. Vrolik. Amsterd. 1842. Folio.

The internal structure of the Chimpanzee was first described by Tyson, in the year 1699, in a masterly work for the time. It was more than a

century before any new contributions were added, and though Owen has written on its Osteography, and Sandifort on its Myology, yet enough remained to afford rich gleanings for Vrolik the younger. I will only quote one portion of his excellent work: The wrist, as in man, has only eight little bones, while in all other apes, even in the orang-outang, it has nine, to which the supernumérary many cornered bone, as Ilg calls it, is to be added. The *latissimus dorsi* is the same as in other apes, and always sends off a slip to the olecranon. The extensor of the index finger is not a separate muscle, and therefore it cannot perform the act of pointing out and showing. This want, without doubt, has reference to the less perfect state of the intellectual faculties, and the impossibility of forming abstract ideas. The reporter has, in his Monograph on Apes, pointed out this defect in the same way. Vrolik has very fairly shown the superiority of the human hand over that of the ape. The sac of the head of the windpipe is sometimes single, sometimes double, and appears to be only a prolongation of the ventricles of the larynx. The vermiform appendage of the cæcum is separated from it by a constriction. Vrolik mentions a difference between the brain of the orang-outang and the human brain, which has hitherto been overlooked; that the *corpus callosum* in the former is much shorter, and does not quite reach to the anterior *corpora quadrigemina*. The internal structure is well exhibited in seven plates: and there is also a vignette, representing the live Chimpansee in London.

J. Brooke asserts, that in Borneo, according to the report of the natives, and his own researches, two or three species of Orang-Outang are indigenous. (Ann. of Nat. Hist. ix. p. 54).

One species is, the *Mias pappan* (*Simia Wurmbii*, Owen), with cheek callosities in the male, as well as in the female and in the young ones. Brooke killed a male, which measured from head to heel, four feet. The *Mias kassar* is considered by the Malays and Dyaks as a different species, without cheek callosities in both sexes, much smaller and weaker; hands and feet proportioned to the body, not such gigantic extremities as in the *Pappan*; the countenance projecting at the under part, and the eyes externally larger. Brooke killed two grown females, one with young, and an almost grown male. He supposes this Kassar to be Owen's *Simia morio*: both species inhabit the same woods, yet Brooke did not find them together on the same day. The latter is most abundant. The third species, *Mias Rambi*, from the report of the natives, must be as tall as the *Pappan*, or even taller, but not so stout, with longer hair, smaller countenance, and, in both sexes, wanting cheek callosities. As Brooke sent five live orang-outangs to England, we may expect some farther information in regard to these species.

Is. Geoffroy has again distinguished two species of our orang-outangs; the *Pithecus satyrus* of Borneo and Sumatra, and another of Sumatra, which he calls *P. bicolor*, because the fur above, and in the middle of the belly, is red; while behind the belly, on the sides, shoulders, inside the thighs, and around the mouth, it is fulvous white. The sockets of the eyes, in the former, are longish and oval; in the latter, four-cornered, and scarcely longer than broad. The latter is the one which lately was alive in the Menagerie (Compt. Rend. xv. p. 720). As the colour and form of the sockets are variable, this new species appears very problematical.

Sur les Singes de l'Ancien Monde, spécialement sur les Genres Gibbon et Semnopithèque par M. Is. Geoffroy. (Compt. Rend. xv. p. 746).

Is. Geoffroy will contribute a copious work upon these genera, in Jacquemont's "Voyage aux Indes;" and meanwhile, he gives an extract from it:—He enumerates ten species of Gibbons,—1. *Hylobates leuciscus*: 2. *H. agilis*: 3. *H. Rafflesii*: 4. *H. albimanus*: 5. *H. leucogenys*; habitat unknown: 6. *H. Hoolock*: 7. *H. choromandus*, not yet exactly identified: 8. *H. concolor*, Harl., a species to which, as Is. Geoffroy says, Dutch zoologists have incorrectly attached the fulvous and brown Gibbons from Borneo; he does not, however, mention to what these properly belong: 9. *H. syndactylus*: 10. *H. entelloides*, a new species of Is. Geoffroy, with this character: fur very light fulvous colour; orbit of the face white; face and hands black; cheek callosities small and round; second and third toes united by a piece of skin, almost to the joining of the first with the second joint: from the Peninsula of Malacca.

Blyth remarks in a letter (Ann. of Nat. Hist. ix. p. 61), that Lieut. Beagin, from a sketch of *Hylobates leucogenys*, recognised an animal which he had often met in the Malabar ghauts, where it lived in the jungles, generally in groups of eight or ten.

Of the genus *Semnopithecus*, Is. Geoffroy enumerates fifteen species, besides one *Nasalis*. He describes a new species, *Semnopithecus dussumieri*:—body greyish-brown; head, throat, sides, and under part of body, fulvous; tail and legs brown, which, on a great portion of the tail, on the fore-arms, and the hands and feet, passes into red-brown (roux); hair upon the head divergent: from the Malabar coast.

In the Ann. of Nat. Hist. x. p. 256, Gray adds a species also to the slender apes, viz., *Presbytis nobilis*: bright rufous, without any streak on the shoulders. Habitat, India: British Museum. This species differs from the *Simia melalophos* in being darker, and not having a black crest; from *P. flavimanus* in being of a nearly uniform auburn, and not yellow, with a blackish back, and in having no black streak across the shoulder or on the cheek.

In the Ann. of Nat. Hist. ix. p. 503, Owen has shown that the stomach, cæcum, and the rest of the intestinal canal, in the *Colobus ursinus*, are of the same nature as in the *Semnopithecus*, which was to be expected after Rüppell had proved the same thing in the *Colobus guereza*; cheek pouches wanting. Owen has confirmed the identity of the *C. ursinus* with *polycomos*, as shown by myself. The latter name is to be retained as the original.

Mr. Thomson, Surgeon of the last Niger Expedition, brought home a large arm-shield, made from the skin of *Colobus guereza*. The shield consists of the greater part of the back with the white stripe; and is distinguished from an Abyssinian specimen in the British Museum, by the white band being considerably broader, and not furnished with quite such long hair. (Ann. Nat. Hist. x. p. 203).

For fixing the hitherto very uncertain accounts of the habitat of a great portion of the African Apes, the following notices of Fraser, the Naturalist of the last Niger Expedition, are worthy of attention. (Ann. of Nat. Hist. ix. p. 262). In the neighbourhood of Sierra Leone, were found *Simia troglodytes*, *Colobus ursinus*, *Cercopithecus fuliginosus* (common), *C. Sabæus*, and *Cynocephalus papio*. At Bassa, Fraser saw some skins of *Cercopithecus Diana*, said to be common there. At Cape Coast, *Cercopithecus petaurista* is to be found, and *Colobus leucomeros*; skins of the latter, as well as of *Cercopithecus Diana*, were extremely plentiful at Accra.

Is. Geoffroy has, in D'Orbign. Dict. Univ. d'Hist. Nat. iii. p. 296, furnished a Monograph on the Genus *Cercopithecus*.

After the separation of the Mangabeys (*Cercopithecus fuliginosus* and *æthiops*, as well as *C. talapoin*), the author enumerates still twenty species of *Cercopithecus*, in which all the grinders are four-sided, and have four tubercles. He groups them in the following way:—*A*. Snout somewhat shorter, body slender, disposition peaceful and soft: *a*. Nose hairy and white.—1. *C. nictitans*: 2. *C. petaurista*; my description of an old male is not noticed, although the difference is considerable. *b*. Sides and under part of the face covered with very long hairs: 3. *C. pogonias*. *c*. Tail lively red: 4. *C. cephus*: 5. *C. erythrotis*. *d*. Tail of different colours, but dull; above the eyes no white bands: 6. *C. labiatus*, a new species of Is. Geoffroy which, by the colour of the upper side and disposition of the cheek hair, is very similar to the *C. nictitans*, but is different in the colour of the under side and tail; the former is dirty white; the latter is, in a great extent, dirty fulvous beneath, and red and black speckled above; the rest black: habitat unknown: 7. *C. Campbelli*: 8. *C. Martini*: 9. *C. Temminckii*; doubtful: 10. *C. monoides*, a new species of Is. Geoffroy, like the Mona, but of a different colour on the under part of the body, which, in the *C. monoides*, is greyish: habitat

unknown. *e.* Like *d.*, but with white bands above the eyes: 11. *C. mona*: 12. *C. roloway*; which Is. Geoffroy separates from the *Diana*, because the back is deep dark brown, almost black (in the *Diana*, brown); farther, the belly is white in the living animal, bordering on orange (in the *Diana*, blackish); and the inner side of the thighs is of the same colour (in the *Diana*, rust-coloured): thus, Bennett's *C. diana* should be placed with the *Roloway*: 13. *C. diana*, founded on the species of Linnaeus and Schreber: 14. *C. leucampyx*; in order to distinguish this species from both the preceding, it is to be remarked, that the white hue upon the under side, in the *C. roloway*, comprises throat, breast, and belly; in the *C. diana*, throat and breast only; and in the *C. leucampyx*, merely the chin; the latter species also has no beard, and the outlines of the forehead are much larger.—*B.* Snout somewhat longer, body less slender, disposition petulant and irritable, fur greenish-grey or green: 15. *C. Lalandii*, Is. Geoff. (*C. pusillus*, Desmoul), is distinguished by Is. Geoffroy from the *C. pygerythrus*, because in it the fur is not properly green, not even on the back or head, but only grey, slightly or scarcely at all sprinkled with a green or olive hue: from the Cape, especially from Cafferland; common: 16. *C. pygerythrus*; like the preceding, but head, back, shoulders, sides, and upper side of the tail yellowish-green, sprinkled with black; differing from the following species (equally with the preceding) by the colour of the hinder parts, the hands, and the black chin: habitat unknown, though Fr. Cuvier, from confounding it with the former one, gives the Cape: 17. *C. cynosuroides*, to which the author joins the *C. tephrops*: 18. *C. griseo-viridis*: 19. *C. Sabaeus*: 20. *C. tantalus*; yet very uncertain: 21. *C. rufo-viridis*; also first characterized by Is. Geoffroy; head superiorly olive-green; back greenish-red; sides pure red; shoulders and thighs greenish-grey; the rest of the upper parts grey; under parts white: habitat unknown. *g.* Fur red. 22. *C. ruber*, from Senegal: 23. *C. pyrrhonotus*, from Nubia. Is. Geoffroy separates both, as specifically distinct, while I, in my monograph (with which the author is not acquainted), have given them as two varieties of the same species. I believe now, on account of their different habitats, it would be better to hold them as separate. It is not the case, however, that in the *C. pyrrhonotus*, as Geoffroy says, the outside of the under part of the limbs is red, and grey in the *C. ruber*; the reverse is exactly the case (*vide* my Monograph). On the *C. albicularis*, the author has no information.

Some farther information on the *Cercopithecus erythrotis* and *Martini* has been given by Mr. Waterhouse in Ann. of Nat. Hist. ix. p. 147.

J. E. Gray describes (Ann. x. p. 256), a *Cercopithecus Burnettii*;—greyish-black; head, neck, and upper part of the back yellow dotted; throat, cheek, abdomen, and inside of legs greyish-white; hair of the cheeks and forehead yellow, with a small black tuft over each eye; hairs

long, pale at the base, then greyish-black; those of the head, neck, back, and root of the tail, with two or three broad yellow-brown subterminal bands; body 19"; end of tail mutilated: from Fernando Po.

Is. Geoffroy separates from *Cercopithecus* a peculiar genus, *MIOPITHECUS* (*muar*, minor).

He gives, as its chief characteristics, in D'Orb. Dict. iii. p. 308,—Skull raised higher above the eye-sockets; partition of the nose pretty broad; nasal fossæ opened downwards and sideways; last grinders less than the anterior ones; in the under jaw, only with three knobs, two anterior, and one posterior; similar arrangement in the upper jaw; size much inferior to that of the other apes of the Old World. The genus is founded upon the *Simia talapoin*. As a second species, Is. Geoffroy adds to it a *Miopithecus capillatus*, very like to the first, but somewhat bigger; colour reddish with a dash of olive, not green; the back-hair, in its under half, black, not grey; also wants the tufts of yellow sideways inclined hair, which the Talapoin has on the cheeks. As the skull and teeth of the new species are not known, there remains an uncertainty whether it properly belongs to this genus.

The *Inuus speciosus* has been fully described by Temminck in the Faun. Jap. Mam. p. 9.

It agrees most nearly with the *I. ecaudatus*, but is $\frac{1}{3}$ th less. This is the only species of ape in the Japanese islands, and not in all localities. It is pretty common in the island Sikok, and in the province of Aki (island Nippon); in that of Kiusiu, the southernmost of this group; it is found in the mountains of Figo; its geographical distribution will, on this account, be bounded by 35° north latitude. It lives in herds, and is as docile as the *I. ecaudatus*.

AMERICAN MONKEYS.—The reporter has already given the diagnoses of four new Brazilian species in these Archives (8 Jahrg. 1 Bd. p. 357).

J. E. Gray has mentioned some species in the Ann. Nat. Hist. x. p. 256, viz. :—

Eriodes frontatus; no thumb on the hand; reddish-brown, yellowish-brown beneath; forehead, elbows, knees, and the upper side of the arms and of the four hands, black. Young like the adult, but with long white hairs on the cheeks, and amongst the black hair on the forehead: habitat, South America. Captain Belcher. British Musetm. Appears to be a good species. On the contrary, Gray's *Pithecia pogonias* is nothing more than a young male or female of *Pithecia leucocephala*, which figures in the System already, under six different names at least.

Gray has correctly remarked, that *Nyctipithecus trivirgatus*, Humb., and *N. felinus*, Spix, are two very different species. The former has hitherto only been known from the description and drawing of Humboldt, and from a defective specimen, in which the muscles of the ear were almost wholly wanting, so that Gray gives it the name of *Aotus*, and characterizes it; pale-coloured brow, with three narrow converging stripes running together on the nape, the side ones extending on to the cheeks; tail remarkably dark: Brazil. I am not acquainted with this species, but Jhn. Natterer writes me as follows of it:—"On the upper Rio Negro, I found a night-ape, which presents to me too much difference not to separate it from the Southern Miriquina. It differs from this by much shorter and whiter fur—by black streaks upon the crown of the head, which are of equal breadth, running more apart, and almost parallel—by the brownish-grey-white mixed hue of the throat—the anterior part of the neck and the breast,—by the much paler whitish ochre-coloured belly—by the greyer ground-colour of the chest, without mixture of brownish-yellow—by a broad bright yellow-brown stripe from the nape to the root of the tail—by the grey tinge of the root of the tail, without mixture of ochre—and by hair of one colour on the black part of the tail. In the Miriquina of Azara, both the black side stripes of the crown of the head are narrower than the middle stripe, which is as broad again, and represents an oval spot pointed at both ends; the side stripes run towards each other, and often unite with the middle; throat, fore-part of neck, and all the belly, are of a pale ochre-colour; the general hue of the upper side is more brownish-grey, or yellow brownish-grey, without back stripes; the root of the tail is ochre-coloured, as well as the hair of the black part of the tail at its roots; the tail itself has longer hair, especially at the point. The first named Northern Night-Ape seems to be only a somewhat darker variety of the *Simia trivirgata*, Humb. The *N. trivirgatus* of Gray will also belong to it, although, in the latter, the stripes on the head unite on the nape, in which respect it certainly differs from our specimen and from that of Humboldt; but the difference need not be reckoned of much consequence, as in the Miriquina the stripes are often separated, and often united." With these remarks I fully agree, and can confirm them in respect to the *N. felinus*. We distinguish, accordingly, two species,—1. That of Azara, Rengger, Fr. Cuvier, Spix, and myself, described as *Nyctipithecus Azaræ*, Humb., from Paraguay and Southern Brazil, but stretching eastward as far as Para, where Spix found it: 2. The species at first described by Humboldt, now also by Gray and Natterer, *N. trivirgatus*, Humb., from the north-west of Brazil, beyond the Amazon, and the adjoining part of New Grenada. Lastly, a third species could be made, *N. vociferans*, Spix, dwelling in the woods of Tabatinga, on the coast of Peru, if the irregular colouring be present in

all the individuals there, which I do not know, as Spix only brought one specimen. But if it should be merely a variety, it would not be, as Gray supposes, one of the *N. trivirgatus*; but, on account of the agreement in the marking of the head, stripes, and colour of the tail, one of the *N. Azaræ* (*N. felinus*, Spix).

Gray's remark, that the *Cheirogaleus Commersonii* of Vigors and Horsfield, is nothing more than the *N. felinus*, is valuable. I could not bring it in among the half-apes, so that in my monograph, I only mentioned it in a note to *Cheirogaleus*. I cannot imagine how Vigors and Horsfield have made such a serious mistake.

LEMURIDÆ.—Gray defines, in the same work, three new species from Madagascar (x. p. 257).

1. *Lemur coronatus*; ash above, limbs and beneath pale yellowish; face white; orbits grey; cheeks and forehead bright rufous, with a large black spot on the crown; tail thick, end blackish.

2. *Cheirogaleus Smithii*; pale brown; streak up the nose and forehead; the chin and beneath paler; tail redder. Distinguished from *Ch. typicus*, Smith, in British Museum, by its much smaller size and different colour, which is greyish-brown; head a redder brown; orbits black; cheeks and beneath white.

3. *Galago minor*; pale grey; back rather browner washed, beneath whitish; tail elongate, depressed, narrow. Not more than half the size of the *Galago senegalensis*.

CHIROPTERA.

MANY valuable contributions have been given to this order, particularly by Temminck, Gray, and Bachmann.

FRUGIVORA.—Among the ten species of *Chiroptera* brought by Von Siebold from Japan, two belong to the genus *Pteropus*. (Faun. Japon. p. 12).

Both species, *Pt. dasymallus* and *pselaphon*, having been described already, I shall only add some more exact information about their distribution. The former is found in the south of the island Kiusiu, in the district of Satsuma, and rarely at Jakunosima; the latter is only known in the island of Bonin.

Rüppell's *Pt. schoënsis* is from Schoa; "eaudatus, auriculus brevis, halluce elongato, corporis colore cervino, regione epigastrica canescente; macula albicante ante et post auriculas, ad latera faciei a naribus per oculos fascia umbrina; unguibus nigris." Very like the *Pt. Whitei*, s. *labiatus*, but the ears much shorter.

ISTIOPHORA.—Gray defines a new genus, under the name of **STURNIRA** (Ann. Nat. Hist. x. p. 257).

Tail and interfemoral membrane wanting; nose-leaf lanceolate, simple; tragus distinct; inner surface of the lips bearded on the sides; hind feet large; lower lip with a single larger wart surrounded by a series of small ones.

The species is called *St. spectrum*; fur brown, with darker tips to the hairs, beneath pale whitish; membranes dark blackish: Brazil.

Unfortunately, neither are the teeth described, nor is a comparison made with the already identified genera. *Diphylla* appears to stand nearest it.

Gray has two other Brazilian species of this division, viz.:—

1. *Phyllostoma elongatum*.—The front of the lower lip with a large triangular space divided by a central groove; ears rounded, large; tragus slender and lanceolate; nose-leaf elongate, lanceolate, tapering.

2. *Phyllophora megalotis*.—The groove of the lower lip not fringed on the edge; fur blackish, rather pale beneath; nose-leaf large, ovate-lanceolate, longer than broad; ears as long as the head, rounded; fore-arm bone 1" 3"; body and head 2 inches.

I have characterized another Brazilian species, *Phyllostoma excisum*, in these Archives, 8 Jahrg. 1 Bd. p. 358:

Two species are added to the *Rhinolophi*, viz.:—

1. *Rhinolophus fumigatus*, Rüpp. (Mus. Senck. iii. p. 132); similar in the border of the nose and form of the ears to the *Rh. clivosus*, but the tail shorter, the fore-arm longer, the thick long fur dark smoke-grey: from Schoa: 2. *Rh. morio*, J. E. Gray (Ann. x. p. 257), like *Rh. luctus*, but reddish-brown, which is perhaps the effect of brandy: from Malacca, Singapore.

Rh. ferrum equinum has been found in Algiers (Duvernoy in the Mém. de Strasb. iii. p. 3); and besides this, the *Vespertilio murinus*.

GYMNORHINA.—Blasius has imported some interesting observations on the Flight and Habits of Bats, their Wanderings and Geographical Distribution, in the "Versammlung der Naturforscher zu Braunschweig," (p. 62).

The question about their migration finds a sufficient solution in facts connected with the *Vesperugo Nilssonii*. This species exists generally in the latitude of 54–58° in Russia, on the plains, and next it in the upper Harz and the Swedish mountains; I may also add to these the hills at Regensburg. In summer, on account of the clear nights, it is nowhere to be found in all the north of Russia, between 60–70° north latitude; it is first to be seen there in August, when the dark nights begin. The author describes (p. 86), from an original specimen, the *Vespertilio*

volgensis, Eversm., as identical with *V. Daubentonii*, a conclusion which I did not venture to mention in former reports, because, in my specimen, which was much injured by insects, the skin of the wing did not reach to the under end of the shin. The other species of Eversmann, the *Vespertilio turcomanus*, which I have not seen, Blasius describes as a decidedly new species, belonging to the group of *Vespertilio serotinus*.

Schinz has found in Switzerland, *Vespertilio discolor* and *Nattereri*, and has also discovered a new bat in the environs of Zürich, which he calls *Vespertilio minutissimus*. According to his description, the back is dark coffee-brown; the belly dark brown, almost black; ear small, heart-shaped, sloping at the outer margin; tragus broad, lanceolate, with blunt point. Whole length 2" 8"', of which the tail occupies 1"; the whole breadth only 6". (Verh. der schweiz. Gesellsch. 1841, s. 76). It is a pity that Schinz has not followed the plan laid down by Keyserling and Blasius, in the recognition of this species.

Selys Longchamps (Faune Belge, p. 21) insists, that *Vespert. emarginatus* is a peculiar species; he wonders how it could be confounded with *V. mystacinus*; it rather resembles, as he says, the *V. Nattereri*; but differs from both by its woolly projecting hair, bright red on the back and over the interfemoral membrane, by very emarginated ears, thick snout, &c. Its colour is very like *V. serotinus*. The reporter would here remark, that Koch has also placed a separate species very like the *V. mystacinus* in the *V. Schrankii*, which agrees with that one in the number of grinders, the form of the ears, and the flying membrane, but is different in colour. The hair, both on the upper and under surface, is double coloured, namely,—black on the inner half, and on the outer a glittering fulvous brown, perceptibly lighter on the abdomen. Is this the *V. emarginatus*? Selys remarks also (p. 300), that according to his examination of the *V. brachyotis* of Baillon, it is nothing more than a casual variety of *V. pipistrellus* with the ears destroyed.

Cantor's *Vespertilio irretitus* comes from the Chinese Island of Chusan (Ann. ix. p. 481); ears rounded, shorter than the head; tragus lanceolate; muzzle blunt, with some long hairs; fur soft, upon the back brownish-grey, on the belly dust coloured; tail slightly protruding from the interfemoral membrane, the latter thinly haired beneath; grinders 4-5; body 2" 1"; tail 1" 1"; length of ear $2\frac{1}{2}$ lines; breadth of ear 2"; length of the tragus 1".

J. E. Gray has wished to surprise zoologists, by the defining of seven new genera of *Vespertilionidæ* (Ann. Nat. Hist. x. p. 257).

It is evident, that he has paid no attention to the labours of Keyserling and Blasius, as they are in the German language. It is nothing to him, that from this neglect, exactly those characteristics are passed over, on

which alone the genera and sub-genera can be established; and he adheres to those which serve merely for defining the species. I will therefore abridge my account of them. Under *Scotophilus*, Gray will only admit the species whose flying membrane is fixed from the heel to the root of the toes (*V. serotinus*, *discolor*, *Leisleri*, *murinus*). *Noctulinia* is a new genus like *Scotophilus*, but the flying membrane is only fixed to the heel (*V. proterus* and *fulvus*). *Vespertilio* comprises the species which have the feet free, with the wings only attached to the ankles; and the interfemoral membrane is furnished only with a few scattered hairs, and the face is short and hairy (*V. mystacinus*, *Daubentonii*, *Caroli*). From these Gray separates five new genera:—1. *Trilatitus* (!) feet free; interfemoral membrane with cross tufts of hair beneath (*V. Hasseltii*, *macellus*, *blepotis*). 2. *Kerivoula*, the same; but the wing arises from the root of the toes (*V. Hardwickii*, *pictus*, *tenuis*); and two new species, *K. griseus*! habitat unknown; and *K. poensis*, from Fernando Po. 3. *Myotis*; wing extending to root of toes; ear large; tragus long (*V. murinus*, already cited by the author at *Scotophilus*!! *V. Bechsteinii* and *Natereri*). From *Vespert. acillus*, the genus (4.) *Murina* is made; and from *V. harpyia*, the genus (5.) *Harpiocephalus*.

On the genus CENTURIO of Gray, with $\frac{1 \cdot 1 \cdot 1 \cdot 1}{4}$ incisors; large ears; short indented tragus; no tail; deeply cut in flying membrane; I will refer for further information to S. Müller and Schlegel, as the *Centurio senex* of Gray from Amboyna, occurs in their Fauna of the Indian Archipelago.

Bachmann in the Journ. of the Acad. of Nat. Science of Philadelphia, viii. 2 (1842), p. 280, has described four species of *Vespertilio*, collected from North America.

As the author was unacquainted with the work of Keyserling and Blasius, he has overlooked the value of some important characters, as for example, those derived from the grinders, whose number he does not give, whilst he notes all the incisors and canine teeth, although these are universally present in the same number as a constant generic mark, and thus possess no value for specific definition. 1. *Vespertilio monticola*; "Vesp. subulata brevior, auriculis brevioribus, tragus non excedentibus dimidium longitudinem auriculæ; colore fulvo;" body 1" 8"; tail 1½": from Virginia: 2. *V. virginianus*; "V. monticola paululum longior, auriculis paululum longioribus, magisque acutis; dentibus prim. max. sup. simplicibus; interfem. membrana nuda; corpore supra fuligineo-fusco, subtus cinereo-fuscato:" from Virginia: 3. *V. Leibii*; "V. supra fusco-ferrugineus, subtus cinereus, alis auribusque nigris;" body 1" 7"; tail 1" 4": from Michigan: 4. *V. californicus*; "V. fusco-lutescens, vellere longo et molli, trago longitudine dimidium;" body 1" 7"; tail

1' 5". Bechmann remarks of *V. subulatus*, that it is identical with Mr. Muir's *V. lucifugus*, and Green's *V. domesticus*, and that it is very widely distributed, as he has received this species from Carolina and Labrador during summer. *V. carolinensis* is found in autumn, winter, and spring; but in summer appears to wander northwards, and is at that time plentiful in the State of New York.

It should not here be omitted, that according to Blainville's statement, *Rhinopoma carolinense* is a Molossus.

INSECTIVORA.

ACULEATA.—Two new Monographs on the Hedgehogs have appeared since mine.

One is by Burmeister in Ersch and Gruber's Allgem. Encyclop. Bd 37 (1842), under the article *Erinaceus*, and gives a careful and laborious comparison of what has hitherto been published on the family of the Hedgehogs. His opinion, that my *Erinaceus albiventris* must be only a small individual of *E. frontalis*, of which I now possess a specimen, is altogether without good ground.

The other monograph is by Sundevall (Öfversigt af släktet *Erinaceus*, in the Sv. Vetenskaps Acad. Handl. 1841). I have received it as a separate pamphlet, through the editor of our Archives, for the volume in which it is contained will not appear until at a later period. Unfortunately my Monograph of the Hedgehogs had not reached the author, although in the hands of the booksellers since 15th May, 1841, so that my *E. albiventris* is omitted; but definitions might have been given of two other species characterized by me (*E. brachydactylus* and *pruneri*). Sundevall's monograph is rich in personal researches, and is a very valuable contribution to the knowledge of the Hedgehogs. The following species are enumerated:—*a. Erinacei aculeis varie intertextis, verticis prominentibus, non vel parum brevioribus; pili in plerisque longiores, rigidi.* 1. *E. europæus*: 2. *E. frontalis*, Smith: 3. *E. concolor*, Mart.: 4. *E. heterodactylus*, Sund.; "griseus, auriculis magnis, digitis connexis, pedibus posticis 4 dactylis:" from Sennar: 5. *E. æthiopicus*. *b. Erinacei aculeis densius positis, ordinatis, antrorsum sensim multo brevioribus (in Sp. quas vidi, numeri 6–8, pili corporis sunt breves densissimi molles, quasi lanei, auriculæ magnæ):* 6. *E. aurictus*, Pall.: 7. *E. platyotis*, Sund.: 8. *E. ægyptius*, Geoffroy (*E. libycus*, Ehrenb.) The author adds, as species of this division, which he has not seen, *E. hypomelas*, *collaris*, *Grayi*, *spatangus*; and, finally, gives to that one mentioned by Pallas, from Dauria, the name of *E. dauuricus*.

I have next to remark, that the *E. heterodactylus*, Sund., is identical with my *E. pruneri*; the posterior thumb is wanting in both. I supposed this defect in *E. pruneri* and *albiventris*, to be occasioned by an injury, and therefore omitted it in my description; but since Sundevall has found the same, I do not hesitate to state the want of the thumb, on the hinder foot, as a very important diagnostic mark for my *E. pruneri* and *albiventris*. The *E. æthiopicus*, Ehr., perhaps identical with my *E. brachydactylus*, cannot be separated from the group to which *E. auritus* belongs; the bristles are also in this one quite soft. *E. platyotis*, Sund., with the diagnosis,—“dense albido-pilosus, auriculis maximis, pollice postico brevissimo,”—would seem also to belong to my *E. brachydactylus*, were there not too great a difference in the length of the bristles. In the *E. brachydactylus* they are as long as the ears, or even more so; in the *E. platyotis*, on the other hand, Sundevall gives the ears 26–29 millimetres, while the bristles of the back are only 18–19 millimetres. His two specimens came from Egypt. *E. ægypticus*, Geoffr., Sundevall places with the *E. libycus*, Ehrenb., and gives as diagnosis,—“dense molliter albido-pilosus auriculis longit. 1–3 capitis, pollice postico brevi perfecto.” The distinction between it and the former species does not appear to be satisfactory. Certainly Sundevall says of *E. platyotis*,—“simillimus priori (*E. aurito*) et sequenti (*E. ægypt.*), sed ab utroque differt proportioni digitorum et ab *E. ægyptiaco* magnitudine auricularum.” However, I must remark, that in these short-toed animals a difference in length in the toes is at least difficult to detect, and the length of the ears may be modified in consequence of the preparation. Both these species should be more strictly defined, and the constitution of the bristles expressly detailed, according to the mode I have shown. It is very doubtful to which of the three Egyptian species (*E. brachydactylus*, *platyotis*, and *libycus*) the *E. ægypticus*, Geoffroy, belongs. In the Catal. des Mammif. Geoffroy says,—“oreilles très allongées,” which does not exactly agree with Sundevall's *E. ægypticus*. I have referred it to my *E. brachydactylus*.

Duvernoy and Lereboullet (Mem. de Strash. iii. p. 4), have described a stuffed specimen of *Erinaceus algirus* from Oran, with this diagnosis: “*E. auriculis subarcuatis digitis et unguibus mediocribus; toto corpore subtus pilis confertissimis, mollibus, magnopere albis vestito;*” 6” long. It belongs to my second division of the Hedgehogs, and must be a variety of the *E. brachydactylus* or *ægypticus*. In order, however, to be certain of this, the length of the ears and bristles, and particularly the outer and inner structure of the latter, must be specified. It is interesting to know, that the Hedgehog is found at Algiers; whilst, on the other hand, Siebold asserts, that it was introduced into Japan from China.

We have yet to register the “Symbolæ ad Erinacei Europæi anatomien, diss. inaug. quam conscripsit Seubert;” Bonn, 1841, principally

explaining the musculus subcutaneus, and the male organs of generation. Two beautifully drawn plates are appended.

SORICINA.—Duvernoy has presented us with two excellent Treatises on the Shrew-mice,—the one entitled, “*Sur les Dents des Musaraignes, considérées dans leur composition et leur structure intime, leurs rapports avec les mâchoires, leur développement et leur succession*” (Compt. Rend. xv. p. 270, 304, 483, 1000); the other, “*Notices pour servir à la Monographie du genre Musaraigne*” (Magas. de Zool. 1842), with 16 copper-plates.

Next to Wagler, Duvernoy laid the foundation for separating the Shrew-mice into natural groups, which has been further accomplished by him in this new work, in which he has carefully described the species known to him; and, moreover, illustrated the most of them with figures. He enumerates the following species:—I. Subg. *Sorex* (*Crocicidura*, Wagl.) *a* With three small intermediate teeth. 1. *S. araneus*, tab. 38: 2. *S. leucodon*, tab. 39: 3. *S. cyaneus*, Duv., tab. 40, 41: 4. *S. herpestes*, Duv., tab. 42, 43. I had ventured the opinion, in my monograph, that this might be a younger state of *S. varius*; but from this description and the drawing, I see that this cannot be the case, as the *S. herpestes* has long waved hair at the tail, which is totally wanting in the *S. varius*. It is also different from my *S. infumatus*, by its colour. On the other hand, it may be identical with A. Smith's *S. capensisoides* (South Afric. Quart. Journ. 1833, p. 62): 5. *S. crassicaudus*. Duvernoy conjectures, that Geoffroy's *S. myosuroides* may belong to this, but it is by no means the case with the *S. myosuroides* described by myself and Pallas (compare Schreb. Suppl. ii. p. 72).—*b* With four small intermediate teeth: 6. *S. giganteus* (*S. indicus*), tab. 45, according to a specimen from Egypt, wants, on the right side, the third, on the left, the fourth intermediate tooth: 7. *S. Sonneratii**, the animal from Japan, represented on tab. 46, I hold for *S. myosuroides*, Pall: 8. *S. Perrotetii*, Duv., tab. 47, a new species, only of the size of the *S. etruscus*; ear large, fur dark brown above, and on both sides blackish; beneath with a grey tinge: from the Nilgherries, 2300 metres above the sea.—II. Subg. *Amphisorax* (*Sorex*, Wagl.): 9. *A. pygmaeus*, tab. 48: 10. *A. alpinus*, tab. 49: 11. *A. Lesuetrii*, Duv., tab. 50, of the size of *S. etruscus*; fur above somewhat dark ash-grey, lighter on both sides, palest beneath; tail above blackish-grey, beneath pale; lips whitish: from the banks of Wabasch, in the State of Indiana.—III. Subg. *Hydrosorex* (*Crossopus*, Wagl.): 12. *H. carinatus* (*S. fodiens*), tab. 51.—IV. Subg. *Brachysorex*, a new group: points of teeth coloured, upper incisors with only one lobe; the intermediate tooth following does not go over it; under incisors with

2-3 blunt denticulations, as in *Amphisorex*; intermediate teeth 4-5, the first two of which are pretty equal in size, the last wholly rudimentary, and standing inwards to the first large grinder: 13. *B. brevicaudus*, Say, tab. 52: 14. *B. Harlani*, Duv., tab. 53, is perhaps, as the author conjectures, identical with *S. parvus*, Say. In the appendix, *Sorex leucodon* is described and figured, tab. 54. We hope that the author of this distinguished contribution to the Monography of the Shrew-mice will soon give us the promised continuation of his work.

Blasius remarks (Bericht über die 19^{te} Versamml. der Naturforsch. p. 87), that after the examination of several specimens of *Sorex swaveolens* which were collected in the Crimea, on the estate of Pallas, this species is identical with *S. etruscus*. Of this Savi had already remarked, that the side gland was wanting in it, and that its musk smell proceeded from the excrements. From another observation of Blasius, *S. Gmelini* does not seem different from *S. pygmaeus*.

Rüppell, in the Mus. Senckenb. iii. p. 133, described a *Sorex indicus*, var. *cinereo-tenea*, from Schoa. The dimensions were all the same as in the Indian specimens, only the colour was different; upper side, feet, and tail, dark grey passing into red-brown, with a sort of metallic gloss; under side ash-grey; whole length 7", of which the tail occupies 1-3. The *S. flavescens* stands nearest it in point of colour, but the tail is only 1-4.

Temminck has described already one species of the Shrew-mice of Japan, *Crossopus platycephalus*, Faun. Japon., p. 23; it is a third bigger than our Water Shrew-mouse, dark brown above, dark grey beneath.

Gray has made known two species of Shrew-mice from India, in the Annals of Nat. Hist. x. p. 261.—1. *Crossopus himalayicus*; slate-coloured black, with longer and white-tipped hairs on the sides and rump; lower part of the throat and the middle of the belly rusty brown; tail scaly, with adpressed dark brown hairs above, and elongate rigid whitish hairs beneath; feet rather naked; teeth white; body $5\frac{1}{2}$ inc., tail 3". This, from its white teeth and naked feet, is not a *Crossopus*, but a *Crocidura*. 2. *Corsira nigrescens*; blackish lead-colour washed with rufous; chin and beneath pale and rather more rufous; whiskers dark; claws white, ears hid in the fur; cutting teeth brown at the tip; body 3" 6"; tail 1" 4": from India.

In conclusion, I may remark, that I possess a specimen of the *S. varius*, from which I observe, that it agrees in the teeth with *S. araneus*; but, from the want of the long undulated hair on the tail, it differs from all the species of the *Crocidura*: the sub-genus *Myosorex* of Gray is thus established. On the other hand, *S. varius* is not, as Gray imagines, identical with *cinnamomeus*, as I have convinced myself by the examination of specimens of both at Berlin. In them, also, the tail is

furnished with long waved hair, and therefore these species are to be ranked under *Crocidura*. *S. pulchellus* will also belong to this division, as its teeth are snow white.

Duvernoy has added a copious Supplement to his earlier Treatises on *Macroscelides Rozeti*, in the Mém. de Strasb. iii. p. 50.

It treats of the skeleton and the structure of the teeth, the formation of the snout, the gland of the tail, the digestive apparatus, and the female parts of generation. It is rich in personal observations, and in deep acquaintance with the literature. A plate shows the anatomical peculiarities mentioned.

TALPINA.—Temminck has, a short while ago, given the description of a new genus, *UROTRICHUS*, which he announced some years since.

It is to be found, in the Dutch language, in the Instituut of Verslag. van het K. N. Instit. van Wetenschapp., Amst. 1842, p. 212; and in French, in the Faun. Jap. p. 20; also in Guérin's Magas. de Zool. 1842, Mammif. pl. 55. Head elongated, with a long thin snout naked at the end, formed of two cylinders; ears and eyes concealed by fur; the feet naked, the anterior like those of the Mole. The tail measures $\frac{1}{3}$ of the length of the body, thick, scaly, and covered with long bristles; teeth 36, whereof $\frac{2}{3}$ incisors, the upper formed as in the *Wüchuhol*. (The skull and teeth, unfortunately, are very indistinctly figured). The *Zygoma* is present. The only species is the *U. talpoides*, of the size of our Water Shrew-mouse, with soft, velvety, glittering, dark brown fur. Plentiful in Japan, never in the level, but in hilly regions, where it digs like the Mole, but does not cast up hillocks.

Japan has also a peculiar species of Mole, called by Temminck *Talpa Wogura*. It is, like our own, but with only six instead of eight incisors in the lower jaw, and of a light brown colour, which is brighter on the sides, and becomes reddish on the belly. On all the Japan islands. At Sikok a black variety is found; at Kiusiu a white.

Bachmann has defined five species of the genus *Scalops*, hitherto known as containing one only.

His descriptions are to be found in the Journ. of Philadelph. viii. 1, p. 58, and 2, p. 292.—1. *Scalops Townsendii*, Nutt.; 44 teeth; fur dark above and beneath, black under the usual admission of light (the hairs are greyish-black till towards the point); tail sparingly covered with short hair; body $7\frac{1}{2}$ "; breadth of fore-hand 7". Another specimen,

caught by Townsend at Columbia River, is about 1" longer, and has a white line under the belly; to this belongs Richardson's *Sc. canadensis*. 2. *Sc. Breweri*; also with 44 teeth; glittering ash-grey; black above, brownish beneath; hands slender; tail flat, broad, and hairy; nasal fossæ situate at the sides instead of on the upper surface of the snout, as in *Sc. aquaticus*; body 6"; tail, without hair, 1"; with hair, 1" 5"; breadth of hand 4"; of tail 4": in Ohio and several of the Northern States. 3. *Sc. argentatus*, Bachm.; like the following species, only 36 teeth; hair of the back, from the roots upwards, furnished with narrow dark blue and white rings to near the points, where a broader grey white ring exists, with such a short brown point, that the clear colour on the upper surface is still visible, and presents a fair silvery appearance; on the under side the hairs are lead coloured, with a whitish and light brown pointed ring standing on end; nasal fossæ on upper surface of snout; body 7"; tail 1"; breadth of hand 10": from Michigan. 4. *Sc. latimanus*, Bachm.; bigger than *Sc. aquaticus*; hair longer, looser, and compact, without the same shining glossy appearance, dark grey with dark brown points; teeth and hands almost double the size of *Sc. aquaticus*; tail naked; body 6" 8"; tail 1" 7"; breadth of hand 10": from Mexico and Texas. According to this, the animal described by me (Schreb. Suppl. ii. s. 104) would belong to *Sc. latimanus*. 5. *Sc. aquaticus*, Linn.; only 5 or 5½" long; colour, although occasionally varying, far brighter than in *Sc. Townsendii*. The young have only 30 teeth till after the first year, when they get 36.

CARNIVORA.

URSINA.—The reporter has taken considerable pains, to show that the specific identity of the Cavern Bears with the Brown Land Bears, as asserted by Blainville, is untenable.

As my treatise from the Mün. gel. Anzeig. (1842, n. 130-132) has been already reviewed in these pages (1843, p. 24), it is superfluous to enter farther upon it. *Procyon psora* is described by Gray in the Ann. of Nat. Hist. x. p. 261. Yellowish-brown and grey, griseled; face, temples, side of neck, chest, belly and sides of body, dirty yellow; forehead, cheeks under the eyes, each side of the throat and back of the ears, blackish-brown; fur rather long, dark brown; longer hairs yellow-white, those of the back, head, and shoulders brown tipped; tail short, perhaps destroyed? body 27"; tail 3"? From California.

MUSTELINA.—Bachmann has given a valuable contribution to the knowledge of the American Weasels.

He shows (Journ. of Philadelph. viii. 2. p. 288), that the European *Mustela vulgaris* is different from the American, as Richardson describes it, and gives the latter the name of *M. fusca*. This American species is of a medium size, between *M. erminea* and *vulgaris*; the tail is shorter than in the first, but longer than in the latter; and, as in the former, black at the end, yet the hairs are short and soft, and not so long and stiff as in the Ermine. The upper side is brown, the under pure white, without mixture of brown hairs, as is the case in the *M. vulgaris*; at the same time, the white hue extends farther out, and reaches, on the inside of the legs, down to the tarsus; whilst, in the European Weasel, it scarcely reaches the thighs.

				<i>M. erminea.</i>		<i>M. fusca.</i>		<i>M. vulgaris.</i>
Body	...	...	...	11" 7'''	...	9" 0'''	...	7" 0'''
Tail	...	...	...	4 6	...	2 9	...	1 9
Tail with hair	...	...	...	6 2	...	3 2	...	2 1
Height of ear, posteriorly				0 2½	...	0 3	...	0 2

Bachmann kept an Ermine and a Weasel in his house during winter; the first became all white, the latter not. He is convinced, that *M. fusca* does not become white, at least in the latitude of New York, which is not the case with the Weasel (*M. vulgaris*), hitherto supposed to be identical with the former. *M. fusca* extends, in the southern states, as far as the upper parts of South Carolina and Georgia. The reporter remarks, that the *M. fusca* is identical with *M. cicognanii*, Bonap. Bachmann, however, has rendered great service, in having shown, in a convincing manner, the specific difference of this from *M. vulgaris*. Bachmann does not appear yet to know, that the identity also of the American Ermine with the European is doubted, which is unfortunate on this account, since he first could give a decision on this point.

Bachmann has added the description of *Mustela frenata*, Licht.

Karelin raised the question, in the Bullet. de Mosc. 1841, p. 572, whether the Zobel of Altai, of which he sent two specimens while on his tour, may not constitute a different species from the Zobel of Eastern Siberia. The Altai differs from the Siberian by the body being more extended, and by yellowish spots on the throat. From these marks, we might place the Zobel of Altai with the Martens; but it is a real Zobel, as its hairy coat extends under the paws.

The reporter gave an extended notice, in these Archives, 8 Jahrg. 1 Bd. p. 258, of a new Brazilian species of *Lutra*—*L. solitaria*, Natt.

P. Gervais has observed (Institut. 1842, p. 117), that *Arctonyx* must not be placed with *Meles*, but with *Mydaus*, as the reporter had previously done.

Laurillard asserts, that Morren has found, in the tertiary formation at Brussels, the remains of a Badger intermingled with those of *Batrachia*, Snakes, Birds, and Shark teeth. He proposes the name *Meles Morreni* (D'Orb. Diet. Univ. ii. p. 593) for the species.

H. von Meyer has obtained from the brown coal of Käpfnach, in Switzerland, a fragment of the under jaw with the teeth, of a genus intermediate between the Badger and Weasel, which he has named *Trochictis*. The species is named *Tr. carbonaria* (Jahrb. F. Min. 1842, p. 586).

It was announced, in the "Oversigt over det K. danske Vetensk. Selskabs Forhandl. i. Aar. 1841," that Lund had discovered, among the Brazilian beasts of prey at present existing, a new genus, between that of the Wolverine (Jaërv.) and the Dog, which has been named by him *Cynogale venatica*. Farther information must be waited for before the family of the said species can be determined.

VIVERRINA.—Mr. T. R. H. Thomson has described, in the Annals of Nat. Hist. x. p. 204, a *Genetta Richardsonii* from Fernando Po.

Rich fulvous; three streaks on the nape; numerous unequal spots on the back, sides, and limbs, and twelve bands on the tail black; nose grey; feet greyish fulvous, scarcely spotted; legs, cheeks, belly, and inner side of limbs brighter fulvous; body $13\frac{1}{2}$, tail $12\frac{1}{2}$ inches. Might not this be a young *Genetta poensis*, Wat.?

The difference between the Algerine Genetts and those of the Cape and South of Europe, has been shown by Lereboullet (Mém. de Strasb. iii. p. 7). The Strasburg Museum possesses a specimen of each of these Genetts; but no special habitat is assigned to the latter. The author finds the following difference:—The Algerine Genett has larger, closer, darker, and full spots; a peculiar white spot above the eye is wanting; the paws brown. In the Cape Genett the spots are more distant, fulvous in the middle; the paws grey. In the European Genett the tail is longer than the body; in the Algerine it reaches to the eye; in the Cape Genett to the nape; and has eleven black rings, and a white tip, while the others have only nine; and the ear is hairy inside, in the others the edges only are so. The reporter remarks, that a supposed Spanish Genett, of the Vienna Museum, agrees pretty nearly in the colour and length of the tail, since it has about ten black rings, with a brownish-yellow tip, and is as long as the body (each 17"); there are also spots on the sides, full and large, like the Strasburg specimen. We might thus distinguish this Genett as *Viverra genetta*, var. *Europea*, if these marks should prove to be constant in several individuals.

The discovery of a *Mangusta* in Spain is important for animal Geography.

J. E. Gray mentions in the Ann. of Nat. Hist. ix. p. 50^e that Captain Widdrington had brought from Sierra Morena an *Ichneumon* (along with a *Felis pardina*), to which he gives the name of *Herpestes Widdringtonii*;—fur black and white, grised; side of the nose, feet, and end of tail blackish; the hair of the back is long, black, with three broad white rings, and a very fine brownish tip; under fur soft, bay coloured; hairs of the face short and adpressed; throat and belly nakedish; ears short, rounded, covered with short soft fine ringed hairs; body twenty-two, tail twenty inches. Very nearly allied to *H. ichneumon*, but it differs from that species in the hairs being much shorter, and having only three rings; while the hairs of the back of the *H. ichneumon* are white, with seven broad black rings, leaving a long white base, and only narrow rings between the black ones above. It would be another important fact for the geographical distribution of animals, if the *Paradoxurus Nubia*, Fr. Cuvier (Mammif. 71 livr.), was actually a native of Nubia, whence Burton is alleged to have brought it. It agrees so much with our *P. felinus*, that one might believe the description of the *P. Nubia* was drawn from this specimen. What, however, I much doubt, is the assertion that its habitat is Nubia, since, of the whole genus, no species is known from Africa; and from the carrying about of specimens, their secondary dwelling is often taken for their original.

J. E. Gray has given a remarkable specimen of his love of making genera, in the Ann. x. p. 260, as, from a very doubtful drawing in Hardwicke's Illustrations of Indian Zoology, which he at first looked upon as *Viverra fusca*, he has characterized a genus *Osmectis*, without knowing any thing of the nature of the teeth, or of the structure of the soles. He believes he has discovered in it the Indian representative of the *Nasua*. I, on the contrary (Schreb. Suppl. ii. p. 289), have guessed it to be a *Paradoxurus*.

CANINA.—Gray has given some notices on the Wild Dogs of New Holland, in his Journal of Two Expeditions in North-west and Western Australia.

Besides the Dingo, he saw in North-western Australia, a totally different dog. Its colour is the same, but partly with a blackish tinge; the nose is long, thin, and very pointed, like that of the greyhound, but the shape is more sturdy. According to the report of some of his travelling companions, who had been at Timor, this dog must agree with the one common in that island (*Canis rutilans*), which is the more probable, as it was only seen in the company of natives; whilst the Dingo was found in some regions abundant in the wild state.

Delessert gave a sketch of the *Canis primævus* in *Souv. d'un Voy. dans l'Inde*, p. 16, tab. 2. He killed one at Gengy, on the coast of Coromandel, and saw them often in the Nilgherries, hunting in companies of three and four.

Canis Azarae was found by Bridges in the valleys of the east side of the Andes of Chili, between 34° and 35°. It seems to differ from the Great Fox of Chili, called *Culpeo*; by having coarser ears. *Ann. of Nat. Hist.* ix. p. 509. Waterhouse remarked (p. 512), that this Fox differed from that figured in the *Zoology of the Voyage of the Beagle*, in having no black on the chin and corners of the mouth.

HYÆNINA.—A comparison of the specific differences by which the *Hyæna brunnea* is distinguished from the *Hyæna striata* and *crocota*, in the construction of the skull and teeth, has appeared by the reporter.

It is to be found in the *Abh. der Münchn. Akadem.* iii. p. 607, and is accompanied by a plate of the skull of the *H. brunnea*, of the size of nature, with a representation of the canine and molar teeth of the other species.

FELINA.—Gray has enriched his genus *Leopardus*, with four new species (*Ann. of Nat. Hist.* x. p. 260).

Two species are from Central America, and have been named by him *Leopardus griseus* and *pictus*; the third, *L. Ellioti*, is from Madras; the fourth, *L. Horsfieldii*, from Bhotan. Neither their dimensions are given, nor a comparison with known species; hence a certain recognition of them is impossible; and I content myself with merely naming them. At the Swiss meeting, Bruno introduced a discussion about a South American Cat, which is distinguished from the *Felis pardalis* by its smaller size, and the want of oblique stripes from the shoulders to the haunch; and from the *F. macrura*, by a thicker head and a weak and a shorter tail: he called it *F. pardaloides*. Pictet supposed that it may, perhaps, be a variety of *F. macrura*. (*Isis*, 1842, p. 257.)

PINNIPEDIA.—Rüppell has given a description of a young *Stenmatopus cristatus* in the *Mus. Senck.* iii. p. 134.

There is a notice, in the *Rev. Zool.* 1842, p. 401, of a living Seal taken in Corsica, where they are abundant.

MARSUPIALIA.

OWEN has written the article *Marsupialia* in the third volume of Todd's Cyclopædia of Anatomy and Physiology, with as much copiousness as exactness, and explained the Anatomical Structure by many Wood Cuts.

Mayer has given some valuable remarks on the Anatomy of the Marsupialia in his "Neuen Untersuchungen aus dem Gebiete der Anatom. und Physiolog. 1842, s. 20," concerning the formation of the purse and the purse bones, to which he chiefly ascribes the wide *spouting of the bladder* : also of the parts of generation and of the brain, in which, in opposition to Owen, he recognises convolutions and a corpus callosum.

P. Gervais has made known a very remarkable genus, under the singular name *TARSIPES*. His description is to be found in the Magazine of Zoology, 1842, p. 35-37. The external appearance is, in some measure, that of a Shrew-mouse, but the head is longer, the nose much extended and slender; ears short, rounded, not hairy; hinder limbs somewhat longer than the fore, with naked soles and short toes; fore-feet with five free toes, the point of each forming a small ball as in the *Tarsia*, and projecting over the small nail; on the hinder-feet the second and third toe unite at the smallest part, and even as far as the nail joint; the fourth toe is the longest, and like the fifth, with a small nail, which the ball also projects over; the hinder great toe is opposite and without a nail; the tail is very long, covered at the root by the fur of the back, then the hair becomes quite short like that of a rat's tail; the female is provided with a purse; the skull, at first sight, resembles that of the ant-eater; there is no fixed socket for the joint of the under jaw, and this resembles that of the *Myrmecophaga jubata*, as well as that of the *Monotremæ*. The system of the teeth is as remarkable as the structure of the skull. In the under jaw are found, anteriorly, a couple of knife-shaped teeth directed forwards; towards the posterior third of the tooth-margin of the under jaw-bone, on each side, there is one small tooth and no more. In the upper jaw are at first seen a couple of small incisors; behind them in the first third of the *tooth-margin*, on each side, are small wart-formed teeth, and none any where else. Gervais looks upon this paradoxical genus as constituting a separate family, in the division of the *Didelphis syndactylus*, and gives it the name of *Tarsipedidæ* (!). The reporter would rather bring it, as an anomalous form, under the Insect-eating Marsupials of prey, where, as a separate family, it would assume a place analogous to the *Proteles* among the *Hyænas*.

Gervais gave to his species the name *Tarsipes rostratus*. Fur fulvous brown (hair lead coloured at the root, fulvous at the point), beneath

bright fulvous colour. A darkish stripe along the back, on both sides bordered with light fulvous; besides this, on each side of the back, a reddish-black watered band length-ways; body $4\frac{1}{2}$, tail $3\frac{1}{2}$ inches: from Swan river. Gray soon after described a specimen of the same genus under the name *Tarsipes Spensera*. (Ann. of Nat. Hist. ix. p. 40.) Gervais asserts that this is identical with his own.*

The genus *Chaeropus*, hitherto incompletely known, Gray has defined more exactly and fully. (Ann. of Nat. Hist. ix. p. 41). The slender fore-feet have actually no more than two toes of the same length, and furnished with conical claws. The hinder feet have four toes, the outer ones very small, with a claw, the middle ones very strong and long with a compressed claw; the two inner toes straight, weak, united up to the claws. Tail hairy with a small terminal pencil. Gray names the species described *Ch. castonotis*; brownish-grey, beneath white, sides brownish; length of body 10, of tail $3\frac{1}{2}$, ear $1\frac{3}{4}$ inches. Lives in the bush at Murray, and was sent home by Captain Grey. He also got, in the same district, an animal like the *Ch. ecaudatus*, but with a strong tail. It is, according to him, certain, that from the skin of the first described specimen, the tail had been accidentally lost.

I have, in the meanwhile, given the characters of ten new species of the genus *Didelphys*, in the Archiv. 1842, 1 Bd. p. 358.

Lund has found, in the country investigated by him in the Brazils, Minas Geraes, in all seven living species of Marsupial Rats. (Det. K. Danske Vidensk. Selsk. Afh. viii. p. 236). He brings them into two divisions:—*a*. Large species, with long white bristly hairs projecting far over the others. 1. *Didelphys aurita*, Neuw., agreeing in all respects with the description of the Prince: 2. *D. albiventris*, Lund; very intelligibly described by Markgraf as the *Curigüeya*, but unknown to all other authors. Head, neck, sides of the belly, hair of the back, at the root and posterior half of the tail, pale Isabella-yellow. Extremities, a band through the eye, another above the forehead, points of the hair on the neck, back, and sides, with the anterior half of the tail, black; ears grey, with whitish tips. Whole length 22", of which the body constitutes one half; ears 2" 3". Distinguished from the *D. virginiana*, by its smaller size, longer tail, white belly, and larger ears.—*b*. Smaller

* Gray was induced to the characterizing of a second species, chiefly perhaps by Gervais' inexact description of its locality. Dr. Preiss, to whose kindness I am indebted for the sight of two specimens of this remarkable little animal, assured me that it is quite unknown at Swan River. The individuals brought by him, he received from the natives, at St. George's Sound, who call it Nulbingar. Gray's also came from the same place. It lives in holes of trees, and feeds on fruits and insects. There remains no doubt of the identity of the species of Gervais and Gray.—EDITOR OF ARCHIV.

species, without bristly hairs; in Nos. 3-5, the tail is longer than the body, in Nos. 6, 7, shorter: 3. *D. incanu*, Lund; pure grey above, beneath white; a greyish-black band through the eye; tail light brown, towards tip whitish, naked to the root; ears grey. Very different from *D. cinerea*, Temm.; body 4"; tail 5": 4. *D. murina*, Auct.: 5. *D. pusilla*, Desm.; only portions of the skeleton, which point to Azara's *Enano* (?): 6. *D. tricolor*, in size and colour quite agreeing with Azara's *Colicorto*, but the colour of the sides, which he calls a lively cinnamon hue, is, in the living species, merely ochre-yellow, on which account, Lund places it with doubt with the *D. tricolor*: 7. *D. trilineata*, described by Markgraf as a Shrew-mouse.

J. E. Gray has increased the genus *Phascogale* with two new species. The one he names *Ph. apicalis*, in size and appearance resembling the *Ph. minima*, but differing in having long white tips to the dark brown and black hairs; in the short conical tapering tail, covered with longish yellowish-tipt hairs, but chiefly in having a terminal pencil of black-tipt hairs. In the upper jaw were found only two false grinders, probably in consequence of its youth: Habitat unknown. (Ann. ix. p. 518). To the other species, Gray gives the name *Ph. leucopus*; fur grey, washed with blackish; head rather redder; lips, chin, throat, chest, and belly, inside of legs and feet, white; tail slender, under half white, upper blackish brown; ears large. Easily distinguished from *Ph. leucogaster* by its white feet. (Ann. x. p. 261.)

Besides these, Mr. Gould has increased the already great number of species of Kangaroos by six. (Ann. ix. p. 345; x. p. 1.) These species are called — *Osphranter antilopinus*, *O. (?) Isabellinus*, *Halmaturus agilis*, *Macropus ocydromus*, *Lagorchestes conspicillatus*, and *L. albipilis*. *Osphranter* is a newly established genus or sub-genus, founded on the great extension of the nasal fossæ and muzzle, the proportionably small size of the lateral toes of the hind-foot, and the great development of the middle toe, &c. It is unnecessary to enter more exactly into this at present, as Gould will farther illustrate these species in his monograph.

RODENTIA.

WATERHOUSE, induced by my Treatise on the Systematic Grouping of the *Rodentia*, has begun the correction of his arrangement in opposition to mine. (Ann. of Nat. Hist. x. p. 197.)

As we both commence from different principles, so it follows that the grouping of families must often be different. Waterhouse places great

importance on the form of the under jaw, whilst I have assigned to it only a very subordinate importance. In particular, I do not classify according to one and the same character, which must always lead to a more or less artificial distribution; but in the fixing of a family, I have been guided by those marks which are prominent in it above the rest. What my method, by this proceeding, obviously loses in logical consequence, it gains richly on the other hand, for it can be made to comprehend the genera together in groups according to nature. On the individual families I shall, where it is necessary, in proceeding, speak more at large; and I thus hope to come to an understanding with Waterhouse, whose distinguished services to Therology I acknowledge with the highest respect.

Miram explains, in the Bull. de Mosc. 1841, p. 541, that the merit of having first drawn attention to the peculiar little bones on the margin of the passage of hearing in the Guinea Pig, does not belong to him but to Leuckart.

The reporter has concluded "Schreber's Säugth. Suppl. iii." with the family of the Mice. The fourth supplementary volume will give the rest of the *Rodentia*, and the remaining orders of land *Mammalia*.

SCIURINA. — Waterhouse (Ann. x. p. 202) has given a wider extension to his family *Sciuridæ*, according to the following scheme:—

FAMILY SCIURIDÆ, with the genera *Sciurus*, *Pteromys*, *Sciuropterus*, *Xerus*, *Tamias*, *Spermophilus*, and *Arctomys*.

Aberrant Forms (without post-orbital process to the frontals).

1. With large ant-orbital opening; palate contracted between the anterior molars... .. *Anomalurus*.
2. With small ant-orbital opening.
 - a. With rootless molars $\frac{5}{4}-\frac{5}{4}$ — *Aplodontia*.
 - b. With rootless molars $\frac{4}{4}-\frac{4}{4}$ — (*Sciuridæ*?)
 - a. Folds of enamel simple *Ascomys*.
 - b. — — complicated *Castor*.

I cannot agree with the union of these aberrant forms to the Squirrels, just because they are aberrant, and could find a legal place elsewhere. I consider *Anomalurus* to belong to the *Myoxinæ*, according to the few notices which are given of it. *Aplodontia* and *Ascomys* rank naturally with the Jumping Mice; and this shows how necessary it is to have characterized a peculiar family, *Cunicularia*, as Pallas had asserted; otherwise the genera of this group must have been scattered among the other families, and these would then have been deprived of their natural character, as the other classification is a forced one. The addition of the

Beaver to the *Sciurinae* destroys completely their natural character; and I know not what definition could then be given of the *Sciuridae*. In his first work on the *Rodentia*, Waterhouse (Lond. Mag. of Nat. Hist. 1839, p. 593) had placed *Castor* and *Ascomys* with *Spalax* in his family of the *Arvicolidae*, a classification, at least, more allowable than the present one under the *Sciurinae*. *Castor* shows, however, in its whole skeleton and dental structure, in the formation of its feet, tail, and secreting apparatus connected with the organs of generation, so many serious deviations even from the Mice, that any union with them is likewise unnatural.

The addition to the new species of the genus *Sciurus* is extremely large, but unfortunately a great part of it is so unsatisfactorily characterized, that the reporter, in the want of specimens, cannot determine on a separation of the species which may be nominal only. He contents himself with simply quoting the species according to their habitats.

a. Indian.—The ample description of the *Sc. Delessertii* by Gervais, with a plate of this species and its skull, as well as of the skull of *Sc. insignis*, *Rafflesii*, and *aureiventer*, has now appeared twice; once in the Magas. de Zool. No. 20, and again in Delessert's Souv. d'un Voy. dans l'Inde, which is much to be disapproved of, as it costs the purchaser double; and amongst the 1200 *Mammalia* which Delessert brought home with him, there must have been sufficient novelty for other plates. Besides, Gervais has, in both works, confounded *Tamias* and *Funambulus* together; while in fact the former have cheek-pouches, and the latter, like true Squirrels, have not.

J. E. Gray describes in the Ann. x. p. 263, six other species:—1. *Sc. rufogularis* from China; very like the *Sc. Rafflesii*, but only half the size; without white on the cheeks; and the shoulders and side of the neck are red. 2. *Sc. rufoniger*; black; throat, inside of legs, and beneath, bright red; along each side an indistinct streak; outside of the thigh grised white: India. 3. *Sc. rufogaster*; reddish, grised; head, side of the neck, and outside of the limbs, leaden-grey, grised; tail and feet black; abdomen red: Malacca. 4. *Sc. atrodorsalis*; grey; middle of the back blackish, slightly grised; cheeks and whiskers yellowish; ears, chest, belly, and under side of limbs, dull rufous; tail blackish, hair with a broad black central band: Bhotan. 5. *Sc. castaneiventris*; very like the *Sc. hippuris*, but only half the size, and the ears are grey: China. 6. *Sc. caniceps*; pale grey, grised; back yellowish, beneath paler grey; tail long, grey, black varied, ringed, hair with three broad black bands: Bhotan.

b. African.—Waterhouse has described three species from the Niger Expedition, in the Ann. x. p. 202:—1. *Sc. Stangeri*; larger than the common Squirrel, with coarse fur, freckled with black and yellow on the upper parts of the body; the abdomen thinly covered with hair; tail

very large and bushy. 2. *Sc. rufobrachium*; like the *Sc. annulatus*, but rather larger, more beautifully coloured, and has the posterior part of the fore and hind legs fringed with rusty-red hairs. 3. *Sc. leucogenys*; above rich brown from the admixture of black and rich yellow; beneath white; tail principally black, but the hairs tipped with white and red at the root; the mesial portion of the tail beneath is bright rusty-red; the sides of the face white; the size about that of the common Squirrel.

c. *North American*.—Bachmann published, in the Journ. of the Acad. of Nat. Sc. of Philadelphia, viii. 2 (1842), p. 310, six North American species:—1. *Sc. lanigerus*; fur long and woolly; tail thick, bushy, scarcely two-rowed; nose, ears, and feet, almost black; upper side dark grey, sprinkled with brown; under side pale brown; body 12"; tail 11": N. California. 2. *Sc. mustelinus*; whole body uniform shining black; 10" long; tail 13": from California. Distinct from *Sc. niger*, by the want of the white on the nose and ears. 3. *Sc. ferrugineiventris*; above bright grey, reddish-brown on the shoulders; beneath light red; body 8" 10"; tail 10": California. It so much resembles some varieties of *Sc. cinereus* and *leucotis*, that it might be reckoned a variety of the one or other, were not the great distance of their habitats an objection. 5. *Sc. mollipilosus*; dark brown, red on the sides; beneath grey: allied to the *Sc. hudsonicus*, but the light colour of the belly is much less: between the colouring of the back and the under side there is no dark line, &c.; body 8½"; tail 7": N. California. 6. *Sc. occidentalis*; fur long and soft; head, back stripe and tail, black; sides brown, mixed with black; under side brown black; ears narrow; body 11"; tail 14". Most nearly allied to the black variety of *Sc. leucotis*, yet different, as no species was found out of the Atlantic States, westward of the Rocky Mountains, or, with the exception of *Sc. capistratus*, westward of the Mississippi. Eight permanent or uncertain species of black North American Squirrels are now known.

Lesson defines two species from Central America, in his Tableau du Règne Animal, p. 112—*Sc. Piladei* (!) from St. Salvador, and *Sc. Adolphei*, from Nicaragua. The first is evidently nothing else than *Sc. aureogaster*, Fr. Cuvier; the other has, as Lesson says, a great resemblance to the *Capistrate à longue queue* of Fr. Cuvier, yet he does not speak of a white colouring on the nose. Gray's *Sc. Richardsonii* is from Honduras (Ann. x. p. 264). Black, brown, varied; hairs black, with a broad subcentral brown band; cheeks and sides brown; middle of throat, chest, belly, and inner side of the limbs, white; hair of tail with long white tips; feet black; ears hairy; length of the body, and head, ? of tail, ? If Gray himself cannot give the length of his new species, who can?

d. *South American*.—The reporter published in the Archives, 1842, vol. i. p. 360, two new Brazilian species:—*Sc. igniventris* and *pyrrho-*

notus, Natt. Further researches have since shown, that the *Sc. æstuans*, found in the southern part of Brazil, has a representative in the north-west part, which is distinguished by the ochre colour of its throat, and on this account, has been named by us *Sc. gilvularis*. Gray's *Sc. Belcheri* is from Columbia; black, minutely dotted with bright yellow; sides of head and outside of legs more orange; feet bay; edge of eyes, and under side of body, bright orange; lips and throat paler; along the sides of the body a black streak between the two colours; whiskers black; ears hairy, slightly pencilled; tail flat, rather narrow, black and red varied, with long white tips to the hairs; body $7\frac{1}{2}$ " ; tail $4\frac{1}{2}$ ". (Ann. x. p. 263.) Gray also mentions another species, habitat unknown, *Sc. splendidus*,—of the size of English Squirrel, but brighter red; hair uniform red-bay to the base; head rather paler; cheeks and chin still more so; belly, and inside of the legs as far as the wrist, pure white; whiskers and tuft of hairs on the temples black; ears rather naked; tail flat, two-rowed, bright red, with hair of one colour to the base. Gray describes, with an interrogation if from India? a *Xerus trivittatus* (Ann. x. p. 264); dark brown, minutely grised with grey; outer sides of the limbs with longer brown hair; broad streak on each side of back, belly, cheeks, lips, throat, lower part of sides and inside of limbs, white; a narrow streak on the middle of the back grey-brown; tail broad, hair whitish, with three broad black bands.

Pteromys has also had a considerable addition to its species. One from Africa, where none of them had been previously known, is important to the knowledge of their geographical distribution. Gray has described three species from the Old World (Ann. of Nat. Hist. x. p. 262). 1. *Pteromys derbianus*; blackish-brown, grey grised; hairs dull black brown with whitish tips; shoulders whitish; tail and feet black; tail round; belly and inside of limbs greyish-white; head above and below blackish-grey; body 14": Sierra Leone, Mr. Whitfield. 2. *Sciuropterus caniceps*; blackish-brown, varied with red bay; hairs long, dark blackish, with red bay-tips; outside of the legs redder, beneath reddish-yellow; head iron grey with longer black interspersed hairs; throat white; chin black; tail flattish, black, with some reddish-tipped hairs; body 9"; tail $8\frac{1}{2}$ ". Sent with the following, by Pearson, from Dargellan (India). Another specimen is about $\frac{1}{3}$ d. smaller; pale above and below; head coloured like the back. Either a young one or new species, which in the latter case, should be named *Sc. Pearsonii*. 3. *Sciuropterus nobilis*; bright chestnut brown, with yellow tips to some of the hairs; pale rufous beneath; the top of the head, shoulders, and a narrow streak down the middle of the upper part of the back, pale fulvous.—Bachman's *Pteromys oregonensis* comes from the Pine Woods on Columbia River, and is minutely described in the Journal of Philadelph. viii. 1, p. 101. It is of medium size, between *Pt. volucella* and *sabrinus*;

brown above, yellowish-white beneath; has longer and narrower ears than the latter; spur at the root of the hand much longer ($11\frac{1}{2}$ lines, in *sabrinus* only 9), and therefore the wings also are much broader; on belly an ochre-coloured tinge, which is wanting in the *Pt. sabrinus*; body 6" 8"; tail 6"; ear 7"; breadth between external margins of wings 8".

The Pouched Squirrels have been enriched with three North American species, collected from the coasts of the Pacific. Two of these, collected by Townsend, are described by Bachmann (Phil. Journ. viii. 1, p. 68):—
 1. *Tamias Townsendii*; like the *T. Lysteri*, but larger; tail much longer; no white stripes on the sides, but a red colour on the haunches; head and back yellowish-brown, with five black stripes lengthways; body 6" 9"; tail, without hair, 4", with hair, 5": Common in the woods on the west coasts, where it lives in holes under the earth. 2. *T. minimus*; a black stripe runs along the spine from the forehead to the tail; on each side a whitish ash-coloured one, then a brown, next a pure white, and at last again a brown stripe accompanies it; under side white; from the nasal fossæ, over the eye, is a white stripe, bordered superiorly with brown; through the eye to the ear runs a red line, under it another; tail slender, superiorly brown, bordered with bright red; body 8" 9"; tail, without hair, 3" 2", with hair, 4": Very plentiful along the banks of the Rio Colorado. The third species, *T. Hindei*, has been described by Gray (Ann. x. p. 264); rufous brown, with three rather close black streaks on the middle of the back, the outer ones edged with a white streak, having an indistinct black edge to it on its outer side; belly white; feet rusty brown; hair of tail red at the base, with a broad black subterminal band and a whitish tip; body 5½"; tail 4½": California.

Blasius remarks, in the Verh. der deutsch. Naturf. zu Braunsch. p. 87, that *Tamias striatus* is found westward from the Ural, almost to the Dwina; and in the woods on the Witschegada and Sissola it abounds. On the other hand, *Pteromys volans* is rarely seen in all the North.

To the American Marmots some additions have been made to their species by Bachmann, in the Journal of Philadelph. viii. 1, p. 6, and ii. p. 319. 1. *Spermophilus Townsendii*, allied to the *Sp. Richardsonii* and *guttatus*, Rich.; above brownish-grey (hair black at the root, then silver-grey, then dark brown, with yellowish-white tip); hair of the under side black, tipped with grey; tail above the same colour as the back, beneath slightly tinged with brown; body 3½"; tail, without hair, 1", with hair, 1½": inhabits the prairies on the Walla-walla; becomes very fat; disappears in August, and appears again early in spring in a very lean condition. 2. *Sp. annulatus*; superiorly reddish-brown, spotted with black; beneath white; tail with 17-20 black rings; body 8" 2"; tail without hair 8", with hair 9" 4": Inhabits the western prairies, without exact limit.

Blasius, in his remarks on the European Marmots (Verh. der 19ten Versamml. d. Naturf. Braunschw. p. 87), laments that the knowledge of the species is not altogether clear. *Sp. guttatus*, the least diffused species, was found by him in the regions of the upper and middle Donetz. Nearly allied to it, he describes the *Sp. musicus*, of the highest Alps of the Caucasus. *Sp. citillus* appears to be diffused from the Danube and Schlesia as far as the Altai.

Arctomys flaviventer has been brought by Douglas, from the mountains between Texas and California; and is described by Bachmann under this name (Journal of Philadelph. viii. 2, p. 309). It is nearly allied to the *A. empetra*, but the feet are brownish-yellow instead of black; abdomen yellow instead of rich rust red; hair of the back yellowish-white and black-coloured instead of rust brown, black and white; claws half as long; body 16"; tail, with hair, 6" 10". Bachmann mentions of *A. monax* (Journ. Phil. p. 322), that rudimentary cheek-pouches, into which a pea could be inserted, are present.

MYOXINA.—Rüppell has described a new species as *Myoxus cineraceus*, in the Mus. Senck. iii. p. 136.

Tail bushy, as in the *M. glis*; upper surface and tail mouse-grey, with a tinge of a light tawny colour; under surface yellowish-bright grey; throat and paws milk white; body $4\frac{1}{2}$ "; tail 2" 5": From Port Natal in South Africa.

A remarkable link has been found between the *Sciuridæ* and the *Myoxidæ* in the *Anomalurus Fraseri*. Fraser discovered this Rodent at Fernando Po, and Waterhouse gave it the above name in the Ann. x. p. 201. The external appearance is that of a *Pteromys*; fur very delicate and soft, and of a sooty colour on the upper parts of the body, freckled with yellow; beneath whitish; on the under side of the basal third of the tail, there is found a doubled longitudinal series of large horny scales, with projecting angles, which assist the animals in climbing; skull in general like that of the Squirrels, but without the post-orbital process, and with a comparatively large ant-orbital opening; molars $\frac{1}{4}$, the palate contracted between them. This genus I rank provisionally with the *Myoxidæ*, or Dormice.

DIPODA.—To *Scirtetes* a species has been added by J. E. Gray. (Ann. x. p. 262.)

He calls it *Alactaga indica*, and says that it agrees with *Sc. acontium* in the proportion and length of the hind feet, but differs from it in this, that it is yellowish, and that the hairs of the tuft of the tail are yellow with black tips; whilst in the *Sc. acontium* the black hairs are one colour to the base, and there is only a slight indication of the peculiar

form of the pads to the hind toes, so strongly developed in the *A. indica*. In it they are compressed, with three to five grooves on each side, and crenated on the front edge; body $3\frac{1}{2}$ "; tail 6"; ear $1''\frac{1}{4}$ "; Candahar, at Quettah.

With regard to the *Dipus vexillarius*, Blasius thinks that it is not essentially different from *D. jaculus*.

Duvernoy and Lereboullet have given a masterly description of the *Dipus mauritanicus*, Duv., in the Mém. de Strassb. iii. The authors have principally compared the anatomical relations most completely, with an exactness which brings to mind the beautiful works of Pallas and Daubenton. The delineation of the muscles of the hind limbs is particularly interesting, as it shows how the latter are fully adapted for powerful springing. The chief anatomical peculiarities are rendered clear by two beautiful plates. In reference to the geographical distribution, the authors remind us, that *Dipus mauritanicus* from the western provinces of Algiers, and also the specimens from Constantine, are not distinguished from those of Tunis and Tripoli. The *Dipus mauritanicus*, however, is larger, stronger, of a darker hue, and the red is more mixed with black, than in the Springing-mouse of Tripoli, which is smaller, and lighter red. The latter has likewise a somewhat longer and narrower head, and comparatively larger ears. The hairs are, besides, in the Algerine Spring-mouse, stiff and pretty rough; in that of Tripoli remarkably fine, and as it were, woolly; and this is also the case in the specimens from Constantine, which approach nearer the Tripoli than the Algiers Spring-mouse.

PSAMMORYCTINA.—The new genus *SCHIZODON* from Chili, described by Waterhouse, in the Ann. of Nat. Hist. ix. p. 507, is allied to the *Psammoryctes* and *Octodon*, as well as to *Ctenomys*.

Fore-feet strong, with large claws for burrowing; ears of moderate size; molars $\frac{1}{4}$, rootless, the crown of each divided into two parts by the meeting of the folds of enamel of the outer and inner side, and the surface of these teeth may be compared to a series of cylinders (two to each tooth), which are much compressed in the antero-posterior direction. The three foremost molars are of equal size, the posterior one smaller. Ant-orbital opening very large, besides a peculiar but very small infra-orbital opening. The only species is *Sch. fuscus*, of the size and colour of the common Rat, but with softer fur; body 9"; tail $1''\frac{1}{2}$ "; ear $5\frac{1}{4}$ ": Very common on the eastern side of the Andes, undermining the whole country, so that horses are continually plunging into the burrows. Figures and further anatomical details are much to be desired.

Lund has divided the South American Bristle Rats into four genera.

(K. Danske Vidensk. Selsk. Naturv. Afhandl. 1841, p. 243). 1. *Phyllomys*; each upper molar consisting of four simple parallel little cross plates. 2. *Echimy*s; upper molars composed of two double cross plates, the limbs of which are united to the inner margin in the form of two separate v. v. 3. *Loncheres*; two little cross plates, the anterior single, the posterior like double v. v. 4. *Nelomys*; upper molars originally consisting of two cross plates, the anterior simple, the posterior in the form of a single v. I have here to remark, that *Phyllomys* is a true *Nelomys*, or rather *Loncheres*, according to my definition; to which also, perhaps, will belong the genus *Lonchophorus*, described by Lund afterwards (p. 282). Lund's *Echimy*s and *Loncheres* are identical with my *Echinomys*; and Lund's *Nelomys* agrees, in all material respects, with Jourdan's genus of the same name (or *Loncheres* according to my definition); but differs from it by the want of bristles, as it appears, and by a small variation in the molars.

Lund has only found some under jaws of *Phyllomys brasiliensis*, in a hole in the valley of the Rio da Velhas. He has obtained no species as yet of his *Echimy*s, to which he joins *E. chrysurus*, *cajennensis*, &c.; but he has got two species of *Loncheres*, which he distinguishes as *L. elegans* and *laticeps*. *Loncheres elegans* he says is generally distributed. It is slender, and of a rat-like appearance; superiorly rich rusty yellow brown, beneath pure white; both colours stop suddenly; tail scaly, thinly covered with hairs, which, towards the end, increase in length, so that they here form a thin pencil; body 8"; tail 8½". In my opinion, this species will be nothing else than *Echinomys leptosoma*, (*E. cajennensis*). Of the habits of the Bristly Rats, hitherto quite unknown, Lund gives us the first information. *L. elegans* keeps in the neighbourhood of standing waters, where it makes its nest amongst the sedges. It swims quickly, visits by night the corn fields, when it climbs the maize stalks, nibbles the ears, and destroys the crop. According to Natterer's information, the species of *Echinomys* ascend the trees, whilst those of *Nelomys* inhabit holes. This latter fact Lund also observed. Of Lund's second species of *Loncheres*, called by him *L. laticeps*, I find no other account by him, than that (p. 99) it is rare. Lund also mentions two living species of *Nelomys* (*Loncheres* of the reporter), *N. antricola* and *sulcidens*. *Nelomys antricola* (p. 246), formerly called by him *Echinomys aperoides* (p. 98), is not a true Bristly Rat, as it wants every trace of bristles, and its hairs are of the usual construction. It is plump, with a thick snout, short ears, and very hairy tail; above grey-brown, composed of a mixture of rusty yellow and black-brown; beneath white; body 10"; tail 7½"; lives in holes, and feeds on all organic substances which it can gnaw. *N. sulcidens*, Lund, is only known from the remains of bones that have been found, according to which it differs in this respect from the other species, that the cutting

teeth have a furrow lengthways. Lund's *N. antricola* is evidently nearly allied to *Loncheres unicolor*, Rüpp., which I have characterized in these Archives last year (1 Bd. s. 361), without being perfectly sure of ranking it under *Loncheres*, since its teeth were not known to me. Two other Brazilian species, *L. macrura* and *nigri-spina*, Natt., are described at the same place.

CUNICULARIA.—Rüppell has added one of the most remarkable forms to Mammalia in his new genus **HETEROCEPHALUS**.

It is represented in the Mus. Senckenb. iii. p. 99, tab. 8, fig. 1, and tab. 10, fig. 3. Skin almost wholly naked, with single hairs here and there; body plump; eyes small; external muscles of the ear obsolete; limbs strong, five toed, with stout claws; tail rather short; cutting teeth strong, smooth, obliquely sharpened; molars $\frac{3}{4}$, consisting of a simple cylinder, the upper ones with an indentation on the inside, the under with two indistinct *protuberances* pushing against each other. To the only hitherto known species, Rüppell has given the name *Heterocephalus glaber*; body, in a straight line, 4"; tail 1" 3"; fore-foot, with middle claw, 7"; hind-foot, with middle claw, 10"; lives in holes in the meadows of Schoa. The reporter, from the plate, finds the skull most nearly resembling that of the *Georhychus*.

Rüppell has made another important addition to this family, in a second North African species of *Rhizomys* (*Tachyoryctes*). Lib. cit. p. 97, tab. 8, fig. 2; tab. 10, fig. 2. He calls this species *Rhizomys macrocephalus*; hair pretty long and extremely delicate; whole upper surface rich reddish-brown with a beautiful silky gloss verging towards metallic (hairs dark bluish-grey, with brown tips); under side dirty yellow grey; body 12"; tail 1" 9"; habitat, earth passages of the pasture meadows of Schoa.

J. E. Gray has defined another species under the name of *Rhizomys minor*; fur grey with browner ends, long, very silky; whiskers brown; sides of head rather browner; tail naked; body 6½"; tail 1½": Indian or Cochin China? (Ann. x. p. 266.)

Bachmann, in the Journ. of Philad. viii. 1, p. 103, has more exactly characterized *Ascomys* (*Geomys*) *borealis*, Rich., and *A. Townsendii*, Rich., hitherto only known by an unsatisfactory notice. *A. borealis* is pale grey; superiorly washed with yellow; under side, feet, claws, and tail white; cutting teeth anteriorly yellow; in the upper ones a slight groove, towards the inner margin, is visible by means of a magnifying glass; body 7½"; tail 2". Bachmann acknowledges, that he has not been able to find out the difference between this and the *A. Townsendii*. He states the body of this latter to be 7½", the tail 2½". Richardson

himself, has at present only said that the tail of the latter is somewhat larger than that of the former: both species are natives of Columbia river.

MURINA.—Waterhouse has made a modification in the arrangement of this family, in the Ann. x. p. 203, after the following scheme:—

FAMILY.—**MURIDÆ**—Genera: *Gerbillus*, *Psammomys*, *Mus*, *Hesperomys*, *Dendromys*, *Phlæomys*, *Cricetomys*, *Cricetus*, *Euryotis*, *Hapalotis*, *Reithrodon*, *Sigmodon*, and *Neotoma*.

Sub-family 1.—*Aspalomyina*—Genera: *Rhizomys*, *Aspalomys*, (*Spalax*), and *Heterocephalus*.

Sub-family 2.—*Arvicolina*—Genera: *Ondatra*, *Arvicola*, and *Lemmus*.

Against this arrangement the reporter has to observe, that its logical sequence is not to be granted, as the two sub-families, taken together, do not, perhaps, form a part of the family *Muridæ*, but stand as an appendix to it. This appendix, moreover, would not be necessary for the *Arvicolæ*, as they, in the most essential respects, bear the type of the Mice, and in their most important difference, the construction of the molars, do not stand isolated, but by *Neotoma* and *Mystromys*, advance into very intimate union with the other divisions of the *Murina*. It is somewhat different with the *Aspalomyina*. These are strange members in the family of the Mice, varying from them very essentially in the structure of the skull, the molars, and cutting teeth, and in the limbs, so that the passage from them to the Mice is only made by a jump. My arrangement and division of the family *Murina* is now completed in Schreber's Suppl. iii.

Two new genera have been described by Gray in the Ann. x. p. 264, **NESOKIA** and **VANDELEURIA**. On their relation to the other genera, the reporter does not venture any judgment, as the present description is not sufficient for that purpose. The molars even of *Vandeleuria* are not known. **NESOKIA.**—Cutting teeth very large, flat in front and smooth; grinders 3; front, in upper jaw, large with three cross ridges; the middle oblong, and the hinder much narrowed behind, each with two cross ridges; the front lower grinder larger, narrowed in front with three cross ridges; hinder each with two ridges, the hindermost smallest; tail short, thick, with whorls of scales and scattered bristles; ears moderate, naked. The author distinguishes this genus from *Mus*, by the large cutting teeth and short tail; he looks on it as intermediate between *Mus* and *Rhizomys*. As a species, he places in it *Mus Hardwickii* from India; and he thinks it probable that Brandt's *Hypudæus Guira* may belong to the genus. **VANDELEURIA.**—Upper cutting teeth triangular, with a deep groove near the middle on the oblique front

edge; ears hairy; fur soft, with some longer bristles; hind feet very long, slender, soles bald beneath; toes 4-5, long, the three middle almost equal, the hinder middle very long; the front outer scarcely visible; the front inner weak; tail very long, scaly, with scattered hairs, and with longer more crowded hairs at the tip. Very like the American *Gerbilli* (*jaculus*) in external appearance and form of hind feet; differs from *Dendromys* in the form and proportion of the toes: lives in bushes and trees in India. The species is *Mus oleraceus*, Sykes? or *M. longicaudatus* of Elliott.

To Smith's genus *Otomys*, the reporter had to furnish a new name, *Malacothrix* (Schreb. Suppl. iii. p. 496), because Fr. Cuvier had, nine years previously, given the same title to another genus (*Euryotis*).

With regard to the new species which have been added to the genus *Mus*, and even to the family *Muridæ*, I shall refer for a notice of them to my monograph of this group, in order to gain room; and I shall only occasionally notice some species, while I shall more closely consider such others as have come to my knowledge since the printing of that work. Lesson's *Mus cæruleus* has slipped out of some colony into the granaries of Rochefort; above slate blue; beneath bluish ash-grey; tail blackish; extremities flesh coloured (Tab. du Règn. Anim. p. 138). Selys (Rev. Zool. p. 346), considers the *Mus hibernicus* as an accidental variety of *M. rattus*. Tobias of Gorlitz, has imparted some interesting observations on the habits of the *Mus minutus*, and formation of its nest. (Isis, 1842, p. 337.) Rüppell has described and given drawings of the North East African Mice, in the Mus. Senckenb. iii. p. 104; viz., *Mus abyssinicus*, *albipes*, *leucosternum*, *dembeensis*, *imberbis*, and *Crice-tomys gambianus*. Of *M. alexandrinus*, Rüppell mentions, in the Verz. d. Senck. Samml. p. 29, that he has received one from North America; and the reporter has it from the Brazil, — a proof how widely these Mice are extended.

Bachmann has described five new species in the Journ. of the Acad. of Nat. Sc. of Philadelphia, viii. p. 300, which he places under *Mus*, but which, as the reporter supposes, do not, perhaps, collectively belong to this genus, but must fall under *Hesperomys*, and, perhaps, under genera yet to be established.

1. *Mus humilis*; reddish-grey above (hair at under part lead-coloured), beneath light fulvous; cheeks, and a side streak, bright rust colour; tail thinly covered with hair, above brown, beneath somewhat lighter; body 2" 9"; tail 2" 4"; ear 3"; South Carolina. 2. *M. (calomys) aureolus*; above bright orange colour; belly light fulvous; throat, breast, and fore-feet, white; body 4" 3"; tail 3" 1"; ear, posteriorly,

3''' : in Carolina and Georgia : climbs very well. Very like *M. leucopus*, but somewhat larger, and the ears rather shorter. 3. *M. michiganensis* ; light greyish-brown, beneath whitish ; cheeks yellow ; body 4'' ; tail 2½'' ; ear 4''' : from Michigan. Differs from *M. leucopus* by its much shorter tail, shorter ears, and the white not extending to the sides. 4. *M. carolinensis* ; light lead colour (hairs of one colour), beneath somewhat paler ; ears long and hairy ; upper cutting teeth slightly furrowed ; body 2'' 4''' ; tail 2'' 9''' ; ear 4''' . Not numerous on the coasts of South Carolina. 5. *M. Lecontei* ; above dark reddish-brown (hairs at root lead coloured) ; beneath light fulvous ; ears slightly projecting from the fur ; upper cutting teeth deeply furrowed ; body 2½'' ; tail 2'' ; ear 1½''' : from Georgia. Professor Schinz showed me two mice, which came from the same State ; one of which agrees with *M. Lecontei*, the other, which seems undescribed, I have named *Mus polionotus* : *M. supra flavido-plumbeus, subtus pedibusque albidus ; auriculis mediocribus ; dent. prim. integris ; cauda pilosa abbreviata ;* body 2'' 4''' ; tail 1'' 2''' ; ears 4''' ; hind foot 7''' . As mentioned already, neither species belong to *Mus*, but their teeth are unknown to me.

Four new Brazilian species of *Hesperomys* have been described in these Archives by the reporter, 1842, 1 Bd. p. 361 :—*H. (Oxymycterus) rostellatus*, Wagn. ; *H. arviculoides*, Pict. ; *H. orobinus* ; and *H. subflavus*, Wagn.

With regard to *Phloeomys Cumingii*, described by Eydoux and Souleyet (Voy. Sur la Bonite, Zool. i. p. 43, tab. 7), I must remark, that it is very different from the animal characterized by Waterhouse. The latter, which I myself had an opportunity of examining at Vienna, is quite black on the back ; tail and feet foxy black. On the other hand, the French zoologists describe their animal as mostly white. It appears, therefore, to be either an *Albino*, or some other species.

Mus barbarus, and *Rhombomys robustus*, Wagn. (*Gerbillus Shawii*, Duv.), have been amply illustrated by Duvernoy and Lereboullet in the Mém. de Strasb. iii. The anatomical peculiarities, particularly the eye, and several systems, have been illustrated with great exactness in both these species, as well as in *Dipus mauritanicus*. Two plates represent these as well as the animals themselves.

The newly described Jumping Mice of Rüppell and A. Smith have already been noticed in my monograph, where also a new species from Syria is described.

Gerbillus erythrurus, Gray (Ann. x. p. 266) ; fur grey-brown, rather grised, under fur lead-coloured ; abdomen whitish ; chin and throat pure white ; tail covered with pale chestnut-brown hairs,* those near the

* The name *erythrurus* (*erythroua*, Gray), is therefore quite unsuitable. It would have been better called *fuscicaudus*.

end black-tipped; upper cutting teeth with a deep central groove; body 5" 3''; tail 4" 3''; Afghanistan.

Much labour has been expended on the group of Burrowing Mice.

Selys placed, in his Faun. Belge, the *Hypudæus agrestis* as a peculiar species. He now recognises his *H. fulvus* as identical with *H. arvalis*; but still lingers on the distinctness of the *H. subterraneus*. The reporter does not know it from observation, but agrees with the opinion of Keyserling and Blasius.

The reporter described a new species from St. Gothard, in Schreb. Suppl. iii. p. 576, under the name of *H. alpinus*, and gave a sketch in tab. 191, B. The name of the *H. nivalis*, of the Faul Horn, was only known to the reporter from the Rev. Zool. 1842, p. 347, at the time his description was printed. He has since found, that a diagnosis of this had already been given in the preceding number of the Zeitschrift, p. 331, from which it is to be concluded, that *H. alpinus* and *nivalis* are identical. Selys also shows *H. neglectus* to be identical with *H. agrestis*. Sundevall has given, in the K. Vetensk. Acad. Handl. for År. 1840, Stockh. 1842, p. 15, a very careful description of the teeth of *H. arvalis* (according to more recent definitions *H. agrestis*), of *H. rutilus* and *glareolus*, and of *Myodus lemmus*, with important remarks on their geographical distribution in Sweden. Correct plates illustrate the teeth of the known species. Two species have been described by Gray in the Ann. x. p. 265:—1. *Arvicola Roylei*; rufous grey, beneath grey; hair dark lead colour at the base; ears moderate, round, hairy; tail covered with pale hairs; first lower grinder has a large rhombic anterior process, and three folds on the outer side and four on the inner one; the hinder upper one has three folds on each side, and an elongated lobe behind; body 3½"; tail 1" 2''; Cashmere. 2. *Arvicola americana*, like the English Water Rat, but only half the size; front cutting teeth slightly grooved on the outer edge: South America. This is the first notice of real Field-Mice being indigenous to South America; but since no authority is given, it may be supposed that an error in the habitus has occurred.

Four new species of North American Burrowing-Mice have been described by Bachmann, in the Journal of Philadelphia, viii. 1, p. 60; and ii. p. 295:—1. *Arvicola Townsendii*: hairs above lead coloured, with dark brown tips, beneath ash-grey; feet and claws brown; ears large, somewhat projecting; body 6"; tail 2½"; breadth of ear 5''; from Columbia River. 2. *A. fulvus*; fur smooth and glossy, above chestnut-brown, beneath whitish-grey; ears and limbs long; body 3" 9''; tail 1" 4''; probably from Illinois. 3. *A. nasutus*; head and nose elongated; fur above dark rust-brown, beneath dirty yellowish-

grey; legs and tail light brown; body 5" 9"; tail 1" 2": abundant in the northern parts of New York. 4. *A. scalopsoides*; head thick; nose blunt; ears concealed; fur short, very soft, above light brown, beneath bright grey; body 4"; tail 10": Long Island,—not rare in the neighbourhood of New York. Differs from *A. pennsylvanica* by its thicker head; by the fur being only half as long and without the longer bristles: from *A. pinetorum*, by its size, and the want of a chestnut-brown hue on the cheeks.

Blasius has given some remarks on the Lemmings, in the *Verh. der Naturf. zu Braunsch.* p. 88. The last under molar has in them four or five alternating prisms; in the *Arvicola* only three, standing obliquely behind each other (not alternating). All the Northern species, as *Myodus hudsonicus*, have convex rounded fore-teeth, which form a bow on the edge. The species found farther south, to 64° latitude (*M. norwegicus* or *lemmus*, *M. torquatus* and *lagurus*), have fore-teeth with single bows running into each other on the anterior surface. The most southern form, *M. migratorius* (*Lemmus obensis*, Brandts; *Georhynchus luteus*, Eversm.), which belong to the Kirguisian Steppes, has flat, not curved, upper fore-teeth.

Rathke has furnished a copious account of the Norwegian Lemming, with regard to its anatomical relations, in the last publications of the *Naturf. Gesellsch. in Danzig*, 1842, p. 1.

Mus betulinus has been found in Sweden by W. Von Düben. He discovered this species at Rönneberga, in the neighbourhood of Landskrona, and described it in the *K. Vetensk. Acad. Handl. Stock.* 1842, p. 175. This discovery points out a wide distribution of the known species; and it is also of importance, as the Prince of Musignano observes, since it afforded Nilsson an opportunity of determining that it cannot be arranged under *Mus*, but must be placed under *Sminthus*. Blasius has, in like manner, convinced himself, that the allied species, *Mus vagus*, belongs to the genus *Sminthus* (*Verh.* p. 87).

CASTORINA.—The position of the nipples of the *Myopotamus* has, since my last year's report, called forth much observation, the most of which is yet deposited with me in manuscript.

It was announced in last year's report, that a Mr. Popelaire had made known a strange animal from Chili, which, among other anomalies, had nipples on its back. Wesmael named this wonderful animal *Mastomys Popelarii*; and Lesson has since given it a second name, *Guillinomys chilensis*. I esteemed the whole account as fabulous. The assertion was, however, not long printed, until the Academy received the *K. Vetensk. Acad. Handl. för År*, 1839, *Stockh.* 1841, in which *Fähræus*

declared, from an examination of a skin, that the nipples, in fact, though not exactly upon the back, yet lay $1\frac{1}{2}$ inches above the mesial line of the sides, and that the animal was nothing else than the well known *Myopotamus coypus*. He promised further information on the receipt of two living specimens, which had been promised him (p. 226, also given in the *Isis*, 1842, p. 356). Sundevall gave a confirmation of this fact, in the *Arsber. om nyare Zool. Arbet.* p. 538. The question was now not one of a fable, but only of correct interpretation. Farther evidence of this appeared. Dr. Rüppell informed me, about the 11th February, that he had found, in two females of the *Myopotamus* from Chili, the nipples, four pair in number, just as Fähræus had described them; and he observed, that Christie, in the *Proceed. Zool. Soc.* 1835, p. 182, had previously mentioned, that in this animal the nipples were situated "uncommonly high on the sides." In a third specimen in Frankfort, probably a male, excrescences were not found on the sides. At the same time, Dr. Schinz informed me, that he had observed the same position of the nipples, not merely in the *Myopotamus*, but also in the *Lagostomus*. About 3d March, I received from Erichson the information, that he had convinced himself, from the examination of a skin from Chili, of the correctness of the earlier assertions. He laid before me, at the same date, a notice from Sundevall, who had kept for a while, in Stockholm, a live adult male of *Myopotamus*, and on which, after its death in the previous May, no trace of excrescences were found. In addition, I have to remark, that I have found, very distinctly, these excrescences in a specimen in the collection here. It is therefore proved, that in *Myopotamus*, merely in the female however, nipple-like organs are found high on the sides, but their function has not yet been pointed out. That they represent nipples is probable, from their absence in the male; but in order to be certain of it, either their connection with the mammary glands, or at least the fact of suction, by means of these organs, must be shown. One circumstance struck me on the examination of the specimen here, a very large old individual, that these excrescences were quite concealed beneath the under fur, and surrounded by it, whilst in others the nipples are situated on the naked skin. It is a very interesting fact, that a similar position of these organs has been found by Dr Schinz in *Lagostomus*, but we have both sought in vain for them in the *Chinchilla*. *

Dr. Rüppell has drawn my attention to a circumstance which deserves farther observation. In both his specimens from Chili, the fur is dark brown, grised with bright brown; the top of the nose is also dark brown, but with a whiter spot at the point, and the mouth is edged with white.

* Neither could I find them in the stuffed skins of *Lagostomus*, especially in the *Hare-mice*, of this collection.—EDITOR OF ARCH.

The specimen here, which also came from Chili, is of the same colour. In a third specimen, said to be from Paraguay, the apex of the nose, with the whole fur, is rusty red; the border of the mouth ash grey.*

Weber showed, in the meeting of Natural Historians at Brunswick (Verh. p. 65), that in the male Beaver, behind the urinary bladder, there lies another bladder, which much resembles a *uterus bicornis*, and consists of two tubes.

ACULEATEA.—*Atherura africana* (*A. fasciculata*, Benn.) was characterized by Gray as follows, from a living and a stuffed specimen (Ann. x. p. 261):—

Spines all dull steel black; of the back strong, elongate, end compressed, angular; of the head, under parts and limbs flat, channelled; whiskers black, bristly; tail elongate, tapering, $\frac{3}{4}$ the length of the body, with a tuft of compressed white elongate quills; ears rounded, somewhat naked, black: Sierra Leone. Very different from the figure of the Indian *Atherura* in the Illustrations of Indian Zoology.

The *Cercolabes melanurus*, characterized by me in these Archives, 1842, 1 Bd. p. 360, has, at the same time, been defined by Gray in the Ann. x. p. 262, under the name *Sphiggurus melanurus*.

SUBUNGULATA—*Dasyprocta nigricans*, Natt., has been distinguished from the other species by the reporter, in the Archives, v. J. 1 Bd. p. 362.

Among the three new species of *Dasyprocta* which Gray has described in the Ann. x. p. 264, his *D. nigra* is identical with our *D. nigricans*, Natt. From a young immature specimen, Wagler had previously marked it as *D. fuliginosa*. Gray's *D. punctata* is the real Aguti described by Azara, to which, therefore, Lichtenstein has given the name of *D. Azare*. This species belongs to Paraguay and the southern regions of Brazil, but is totally absent in the northern, according to Natterer's exact investigations. The *D. aguti*, described by Desmarest, Fr. Cuvier, the Prinz von Wied, and others, is peculiar to the north and east parts of Brazil. Natterer collected most of his specimens at Borba, where the *D. Azare*

* In the specimens in the collection here, the reverse is the case. The South Brazilian have the fore-part of the snout and the margin of the mouth of rather a rich white, while in the Chili specimens above mentioned, the same parts are muddy grey. In one of the South Brazilian, the fore-paws are grey; in another, the whole fur is yellowish-white. The Chili specimen is, on the whole, darker coloured than the South Brazilian, because the black of the scattered hairs more extended. The same is observable in the whiskers, which, in the South Brazilian, are mostly white; in the Chili ones, black, mixed with some brown.

is not to be met with. Gray describes also a *D. albida*; whitish-grey, nearly uniform; the hair of the back elongated, white at the base: from St. Vincents, in the West Indies. Size of a Guinea-pig, *Cavia cobaya*. This species (?) is quite unknown to me.

Lund has, in the often quoted Kopenh. Denkschr. p. 286, also drawn attention to the difference between the two citron yellow *Agutis*. I am of his opinion, that Markgraf's *Aguti* is the one defined by Desmarest and most authors as *D. aguti*. Lund; on the other hand, would totally separate the South Brazilian species from that of Paraguay (the *D. Azarae*, Lichtenst.), and calls the former *D. caudata*. He distinguishes the two by this, that in the *D. Azarae* the rump is of the same colour with the rest of the body (in the *D. caudata*, pure grey); the size is smaller, and the tail shorter. I can, however, affirm, from seeing the numerous South Brazilian specimens in the Vienna collection, that the colour of the rump in them here and there also falls into grey; no difference of size exists; and therefore the specific distinction is inadmissible.

The reporter regrets, that from want of room, he can only epitomise the extensive and valuable communications of Lund in the Kopenh. Denkschr. of 1841.

Lund distinguishes two *Caviae*; a larger darker one, with white belly, which he calls *Cavia aperea*, and considers identical with Lichtenstein's *C. obscura* and *C. leucopyga*, which is correct. To another smaller one, with shining fur passing into reddish, and a yellow-grey belly, he gives the name of *C. rufescens*. This is, as the reporter adds, the same with Wagler's *C. fulgida*. Lund distinguishes a smaller species of *Cerodon rupestris*, which he names *C. savatilis*, but merely characterizes it by the configuration of the skull. *Cælogenys fulvus* and *fuscus* belong to one species; the difference of the skull in regard to smoothness or roughness depending, he is inclined to think, on difference of sex.

DUPPLICIDENTATA.—What Blasius complains of in the Europæo-Siberian Hares, that they are certainly not numerous, but sufficiently intricate, applies still more to the numerous species of the other zones. Blasius has not merely lamented, but busied himself, along with Bachmann, in unravelling this intricacy.

Blasius mentions, in the Verh. der Versamml. der Naturf. zu Braunschweig, p. 88, that after the examination of an Irish Hare, he finds that the *Lepus hibernicus* cannot be separated as a species from *L. variabilis* (*L. borealis*). He describes, moreover, a new species, *L. aquilonius*, already mentioned by Pallas, under the *L. variabilis*, as "*Russak*."

The tail has fourteen vertebrae, as in the *variabilis*, but it is (excluding the hair) of the length of the head, and marked in the same way as in the *L. timidus*, above black, beneath white. The ear is also, as in the *L. timidus*, of the length of the head, the slit of the ear much shorter than the head; upper side brown; head and sides of trunk, thighs, and after part of back, on the outside, dirty greyish-white, without rust colour. This new species appears principally to inhabit between 55° and 63° north latitude, where, in Russia, the *L. timidus* is totally absent. Across the Baltic, towards the west, it is not observed.

Küster has remarked of the Hares of Spalatro (Dalmatia), that they are smaller than ours, with a very bright gray tinge on the loins (Isis, 1842, p. 611):

The dark-tailed variety of the *Lepus crassicaudatus* was correctly described by Rüppell, in the Mus. Senckenb. iii. p. 137, under the name *L. melanurus*:

Bachmann has revised his earlier Monograph on North American Hares, and added four new species.

His new work is contained in the Journ. of the Acad. of Nat. Sc. of Philad. viii. 1, p. 75.—*a.* Species in the higher latitudes, in winter becoming white. 1. *Lepus glacialis*: 2. *L. campestris*, Bach.: 3. *L. americanus*, Erxl. (*L. virginianus*, Harl.): not found, as the author remarks in his corrections, on the other side of the Rocky Mountains; but confined to the north parts of the United States, Canada, and the north-east coast, as far as 64°.—*b.* With long ears and tail: all from the north-west coasts. *L. Townsendii*, Bach., new species, tab. 2; size of *L. americanus*; ears, tail, legs, and tarsi very long; fur above bright grey, beneath white: at Columbia River. 5. *L. longicaudatus*, Gray: 6. *L. nigricaudatus*, Benn.: 7. *L. Richardsonii*, Bach., new species; somewhat larger than *L. sylvaticus*; ears and legs much longer and slenderer; tail shorter; upper side grised grey, under side white: California. *L. californicus*, Gray.—*c.* Tarsi thinly haired, claws projecting over the fur. 9. *L. aquaticus*, Bach.: 10. *L. palustris*, Bach.—*d.* Like *c.*, but the feet thickly haired. 11. *L. sylvaticus*, Bach.—*e.* Small ears; head and tail short. 12. *L. artemisia*, new species; grey, on the nape and the limbs rusty red; under side white; tail above same colour with back, beneath white; tarsi well haired; body 12": at Wallawalla. 12. *L. Bachmani*, Wat., new species; like the *L. palustris*, but about $\frac{1}{4}$ less; ears longer; feet thickly haired; colour less yellow; tail above greyish-black, beneath white; body 10": in the south-west parts of North America. 14. *L. Nuttallii*, Bach.

A new species of Burrowing Hares (*Leporidae*) has been discovered on the mountains of Cabool, *Lagomys rufescens*, Gray (Ann. x. p. 266).

Pale grey, with a bright rufous tinge; base of the hairs dark lead-colour; slightly varied with black on the hinder part of the back; cheeks, middle of throat, abdomen, inner sides of limbs and feet whitish; ears large, hairy, rounded; claws black. On rocky hills near Baker's tomb, at about 6000 or 8000 feet elevation. This is easily known from all the other Old World species, by its pale colour and rufous tinge.

Hodgson procured another species from the snowy region of Nepal, on the border of the Holy Lake, out of which the Trisal Ganga flows. He calls it *Lagomys nepalensis*; and gives the following character of it:—"with broad, rounded, nudish ears, nearly half the length of the head; soles nude on the termino-digital balls only, and soft equable fur, which is dark bay from the snout to waist, and rufescently freckled black thence to the vent; below and the limbs paler bay; snout to vent 7 inches; head 2; ears $\frac{7}{8}$; palm (with nail) $\frac{5}{4}$; planta (with nail) $1\frac{1}{4}$." The female is similar, but smaller. Hodgson himself does not deny the possibility that this species may be identical with *L. Roylei* (Ann. x. p. 76).

EDENTATA.

RÜPPELL gave, in the Mus. Senck. p. 138, an exact description and sketch of a rare species of Sloth in that collection, which he named *Bradypus gularis*.

It is identical with Wagler's *B. cuculliger*, and belongs to the north-eastern parts of Brazil and Guiana. The geographical distribution of two other species has been now fixed by the journeys of Spix and Natterer. *B. infuscatus*, Wagl., inhabits the north-west part of South America; the *B. ai*, Wagl. (*B. tridactylus*, Cuv., Neuw.) inhabits, on the other hand, South Brazil.

Lund and Owen have simultaneously proved, that the assumption of *Megatherium* having a mail-covering is incorrect. Lund's essay is, in the meanwhile, only communicated in a short notice in the Oversigt over det K. danske Vidensk. Selsk. forh. i. Aaret. 1841, p. 161. He remarks, that he has placed his genus *Platyonyx* (which he has separated from *Megalonyx*), next the Sloths, for he is of opinion, that the type of the organization of these animals, as well as of the *Megalonyx* and *Megatherium* is the same, and consequently, that they have no covering of mail.

Owen's description of a tooth and part of the skeleton of the *Glyptodon clavipes* (Transact of the Geol. Soc. of London, vi. p. 81), is one of the best works which has appeared on Palæontology during the preceding year. He brings forward evidence, that the fossil pieces of

mail which were found in South America, do not belong to the *Megatherium*, but to a peculiar genus which he calls *Glyptodon*. Lund, at the same time, gave to it the name *Holophirus*, and D'Alton that of *Pachypus*.

Orycterotherium missouriense is a new species described by Harlan. The bones were found by Koch on the Missouri: the teeth are like those of the *Megalonyx*; the claws like those of *Orycteropus*. (Sillim. Amer. Journ. xlii. p. 392; and in Ann. x. p. 72.)

Harlan, in Sillim. Amer. Journ. xliii. p. 141, quotes Owen's article, *Megatheriidae*, in the Penny Cyclopædia, xv., where are five genera comprehended:—*Megatherium*, *Megalonyx*, *Glossotherium*, *Mylodon*, and *Scelidotherium*. He also puts us in mind, that he had proposed, in 1835, the name *Aulaxodon* or *Pleurodon*, for *Mylodon*. The latter of these two is evidently better than *Mylodon*, which signifies nothing else than grinder. *Orycterotherium* would also belong to the family *Megatheriidae*.

Lund has given some excellent remarks on the Brazilian Armadilloes. (Det K. Danske Vidensk. Selsk. Afh. viii. p. 55, 65, 225.) He distinguishes a species, *Dasypus uroceras* (*D. 8-cinctus*, Linn.), from *Dasypus longicaudus* (*D. 9-cinctus*), of the Prince of Neuwied: it has eight molars, eight bands, and tail somewhat shorter than the body. He has also discovered a smaller species, called by the Indians *Tatu-mirim*.

Mayer has called attention, in his *Neuen Untersuch aus der Anat. and Phys.* p. 32, to a small nipper-like organ, under the tip of the tongue of the *Dasypus*.

Owen has illustrated the anatomical relations of the *Monotremata* in the third volume of Todd's Cyclopædia. The internal structure of these remarkable animals is here very clearly and fundamentally shown, with many illustrative plates. Whoever wishes to become acquainted with their anatomy cannot select a better guide than this article.

SOLIDUNGULA.

THE Natural History of Horses. By Col. Ham. Smith. (The Naturalist's Library, vol. xii.)

The author has brought forward no fewer than twelve species of horses—*a.* The Equine form: 1. *Equus caballus domesticus*: 2. *E. varius*: 3. *E. hippagrus*.—*b.* The Asinine form: 4. *Asinus equuleus*: 5. *A. onager*: 6. *A. hamar*: 7. *A. hemionus*.—*c.* The Hippotigrine form: 8. *Hippotigris zebra*: 9. *H. antiquorum*: 10. *H. Burchelli*: 11. *H. quacha*: 12. *H. isabellinus*.—*E. varius* is the spotted horse, which Moorcroft, Gerard, and others mention. From the species, our Picbald

Horses originate; and, in the year 1815, some squadrons of Bavarian hussars were mounted with them. In the *E. hippagrus*, which rests on the fabulous Koomrah of the North African mountains, the author's lively imagination leads him to believe, that he recognises Oppian's *Hippogrus*. The *Asinus equuleus*, identified with the Yo-to-tse of the Chinese, is defined from a single individual, which, in all its particulars, was nothing more than a Hybrid or Mule, between the Horse and Ass. The *A. hamar* rests merely upon an incorrect drawing of the *Kulan* by Ker Porter. *Hippotigris antiquorum*, or the Zebra of Congo, is distinguished from that of the Cape on insufficient information: *H. isabellinus* is founded upon a stuffed specimen, whose habitat is unknown, but it may be only a variety in colour of the *Quagga*. We see from this, that the slightest marks are sufficient for the creation of new species. The monograph of the reporter on the Horse is, naturally to the author as an Englishman, totally unknown.

PACHYDERMATA.

COUNT KEYSERLING has described an under molar tooth of *Elasmotherium*, which was found in the Kirguisian Steppes, in the neighbourhood of the Caspian Sea. According to his and Brandt's opinion, this genus forms a link between the Rhinoceros and Elephant.

Fischer of Waldheim founds upon this tooth a new species, *E. Keyserlingi*. (Bullet. de Moscow, 1842, p. 254, tab. 3.)

Goddard has announced, after an examination of the *Missurium Kochii*, that it is a *Mastodon*. (Proceed. of the Acad. of Nat. Sc. of Philad. Oct. 1841, p. 115.)

In digging canals in Louisiana, an under jaw was found at the depth of forty-five feet, which, however, was so rotten, that it crumbled to pieces, and only one tooth was preserved. Professor Carpenter holds it for the fifth tooth of a Tapir, which it evidently is from the description, though not from the plate, in which the artist, through exaggeration of the perspective, has quite disfigured the original. (Sillim. Amer. Journ. xlii. p. 390.)

Owen's description of some fossil remains of *Chæropotamus*, *Palæotherium*, *Anoplotherium*, and *Dichobune*, from the cocene formation, Isle of Wight (Transact. of the Geol. Soc. vi. p. 41), gives some explanation of the alliance of *Chæropotamus* with the *Peccaris*. He also describes a new species of *Dichobune*, *D. cervinum*.

There was found, in the newest tertiary formation of South Carolina, (among some bones of Mastodon, Elephant, Stag, Cetacea, Tortoises, Sharks), a fragment of the under jaw of a Boar, in the form and number of the teeth very nearly approximating to the *Babirusa*. Harlan names it *Sus americanus*. (Sillim. Amer. Journ. xliii. p. 143.)

H. v. Meyer has given many valuable remarks on Christol's description of the *Rhinoceros megarhinus*. (Jahresb. f. Mineral, 1842, p. 585.)

RUMINANTIA.

IN the Boston Journal of Nat. Hist. iv. 1 (1842), p. 1, Jackson has furnished a description of the internal Structure of two grown Dromedarics of both sexes.

The *Cervus artisiensis*, D'Orb., has been fully described by Pucheran.

The description is to be found in D'Orb. Dict. Univ. d'Hist. Nat. iii. p. 328. The horns are very peculiar; the rose is very small, surrounded by a pearly wreath; the branch is forked from one-half to two inches, so that the animal seems almost four-horned. These stags inhabit the East Cordilleras of Bolivia, at the height of 4000 metres above the sea.

Laurillard mentions, in the same book, that he is acquainted with about fifty species of antediluvian stags, and although he acknowledges that several nominal species are to be found amongst them, yet he still thinks the number of real species will be pretty abundant.

Pusch ascribes a stag horn, found in Lithuania, to a species which had died out: he names it *Cervus bresciensis*. The reporter must, however, agree completely with the remark added by von Bronn. (Jahrb. für Min. 1842, p. 47.)

Ziegler showed, from a preparation, that in a roe, the Graafian vesicle had already burst in August, so that this does not first occur in November, as Pockel believed from his investigations. (Bericht. über die Vers. der. Naturf. zu Braunsch. s. 82.)

In the Transactions of the Zoological Society of London, 1842, p. 21, Owen has made some remarks on the birth of a Giraffe and the foetal membranes; as well as upon some of the natural and diseased appearances, which the dissection of the young animal presented. A beautiful plate of the mother and young is added.

With respect to geography, it is chiefly worthy of notice, that Rüppell, by the immediate comparison of the Schegal *Antilope redunca* with the Abyssinian, which have hitherto been held identical, has convinced himself, that the latter differs specifically from the former. He now gives

the Abyssinian one the name of *Antilope bohor*. (Verz. d. Senak. Samml. s. 38).

Captain Abbot has informed us, that the *Antilope sagia* lives in large flocks in the Steppes, between the river Oxus and the Caspian. (Ann. ix. p. 147.)

In the 16th number of Smith's South African Zoology, a plate is given of *Antilope gorgon*, with an ample description.

Blasius spoke upon the generic distinction between *Ovis* and *Capra*, at the meeting of Naturalists at Brunswick: (Ber. p. 89.) All Sheep possess a distinct lachrymal groove, which is wanting in Goats. The forehead in *Capra* rises to a steep protuberance; in *Ovis* it is flat, or even somewhat hollowed. In all species of *Ovis*, the greatest diameter of the horn is across the longitudinal direction of the head, while, in all species of the *Capra*, it runs parallel with it. The Goats have, on the anterior side of the horns, at each constriction, two or three stronger transverse knobs, between the smaller cross waves; the Sheep only moderate cross pads. In *Capra*, the form of the hoof, viewed sideways, is four-sided, trapezoidal, scarcely higher before than behind. In *Ovis*, it is three-sided, running out to a point posteriorly, like a goat's hoof cut through diagonally. Blasius also made some remarks on periodicity in the growth of the horns of these animals, which corresponds to the shedding of the antlers in the Stags. The same author farther remarked, that in general, complete specific distinctions were to be found in the arrangement and direction of Sheep's horns. In the *Ovis argali*, *O. montana*, *O. nahor*, and a newly defined species which Brandt has received from the Caspian, the right horn winds in a space to the left, and the left horn to the right. *O. nivicola* and *O. californica* are identical with *O. montana*.

In the *O. musmon* and *O. Vignii*; Hodgs., the horn has the same twist, but so slight, that the anterior surface lies quite on the same level, and the twist is only perceptible on the posterior surface. In the *O. tragelophus*, *O. orientalis*, Gm., *O. burhel*, and the Cyprian Sheep (*O. cyprius*), which Blasius considers as a peculiar species, the left horn is twisted to the left, and the right to the right. The direction of the tips and the spread of the horns is also affected by this construction. Our domestic Sheep, in respect to the horn formation, comes nearest *O. musmon*, and to a species of Brandt's still undescribed.

The reporter is of opinion, that separate names should be given to the constant local forms of the genus; though, in the meanwhile, whether they are to be considered as species, or only as races, which have evidently a permanent type, is a question, the definite answer to which must be furnished from a series of indubitable observations.

The reporter extracts the following quotation from a Report of Karolin,

to the Imperial Society of Naturalists at Moscow. (Bullet. de Mosc. 1841, p. 563.)

"I spent some time on the mountains of Tschingis Taou in the Kirgizian Steppes, to the east of the district Karkaralinsk, where I observed some very remarkable animals, which are known by the name Arkhari, or Mountain Sheep (*Ovis ammon*). I have killed many of these, and among others, a male of almost eight puds. The Arkhates and Tschingis mountains are the true country of these animals; and I think that those of Corsica and Sardinia are a different species."

According to Pallas, the *Argali* was distinguished by the Kirgis-tatars by the name Arkar; since, however, this was found also in the Altai, therefore that Arkhari, which was compared with the *Mufion*, must perhaps rather be *Ovis orientalis*, or the new species of Brandt.

The Mountain Sheep of Cabool, described by Dr. Lord in Burnes' Cabool, p. 384, appears, so far as I can gather from the indistinct account of the direction of the horns, rather to belong to the *Mufions* than to the *Argalis*. Horns three-sided, with anterior angle, the longest side behind, the shortest at the top of head; toward the root they become somewhat four-cornered, whilst, on the fore-side, a knob is observable. They are whitish light brown, cross-rooted; above this, at spaces of from four to six inches, with a cleft or channel. At the root the anterior angles stand about three inches asunder, the posterior are so near, that the little finger can scarcely be inserted between them; at a short distance from their origin they begin to turn backwards, and end twisting round spirally towards the front. Nose convex; lachrymal groove large; no hoof grooves. Colour fulvous, somewhat bay; haunches mixed with grey, behind with a stroke of dirty white, which passes under the belly; head grey; a white or greyish beard under the chin, which passes on towards the breast, of an almost black hue; body 4' 10"; tail 3½"; height of shoulders 3' 2½"; horns, according to the twisting, 2' 8"; inhabits, in great numbers, the mountains north of Cabool, which form a part of the great Hindu Kusch: is called *Gorfund-i-koh* (Mountain Sheep); should also be called *Byz-i-koh* (Mountain Goat).

A remarkable new species of Goat has been found in the Caucasus. Only two species of *Capra* have hitherto been known from these mountains: a third has now been described, under the name *Aegoceros Pallasii*, by Rouillier in the Bullet. de Mosc. 1841, p. 910, and figured in tab. 11. According to the description, the head is very much like that of a Sheep; no lachrymal grooves; under the chin is a beard 3½ inches long. The horns black, wrinkled, moderately thick, semicircular behind, and falling down externally, but afterwards the tips turn upwards and inwards; at the base they are almost triangular, in the middle roundish, compressed towards the tip. Colour of the whole wool chestnut brown. The female has no beard, and only small horns with slight curve. The

buck 4' 3" long; horns 2' 3"; distance between them at root 10", in the middle 1' 4½", at the tip 1' 3": habitat, the heights of the Caucasus. This species comes nearest the *Capra pyrenaica* in the form of the horns.

Keyserling and Blasius have already remarked, in the "Wirbelthieren Europas," that the Cretan Wild Goat, drawn by Belon, is probably *Capra sinaitica*. A specimen in the Königsberg Museum, which is reported to have come from Crete—and is decidedly *C. sinaitica*, as Blasius adds in the appendix—confirms this conjecture (Bericht der Vers. z. Braunsch. p. 91).

The presence of the Wild Goats in the Nilgherries has been proved by Delessert, who killed some there (Journ. d'un Voy. dans l'Inde, p. 116). Blyth was also informed by Lieutenant Beagin, of the existence of a true Ibex upon the Nilgherries, with long knotty horns, and great beard, in which characters it differs from the Himalayan Ibex (Ann. ix. p. 62).

Lord describes two specimens of the Markhor from Cabool, which Vigne also found in Lesser Tibet. Lord calls it a true Goat, which he compares with *Capra agagrus*. Lachrymal grooves wanting. In the first specimen, the horns are long, oval, anteriorly very much flattened, with twelve protuberances or galls, which do not run all round; two finger's-breadth distant from each other at the root, then receding farther, whilst they twist somewhat outwards, upwards, and then backwards; colour muddy brownish-grey, lighter beneath, but almost black on the front of the legs; the beard is black, and confined to a tuft under the chin; tail with a black pencilling of hair; horns towards the root blackish, further up dirty yellow; body 4' 10½"; tail 9"; height of shoulders 2' 10"; horns, according to twist, 2': on the hills north of Cabool. The other specimen came from the hills at Baghlan. Horns, at the posterior base, touching each other, anteriorly separated by a finger's breadth, advancing in long spiral windings upwards, outwards, and a little backwards, forming two complete circuits. Without these circles, the horn would be completely triangular; rings or wrinkles wanting, although it is rough. Colour muddy red-grey, blackish from the horns to the tail; abdomen, haunches, and feet below the knees grey; horns dirty yellowish-white, darker beneath, with distinct annual furrows; beard grey, with long white shaggy hairs continued down on the neck; body 4' 10½"; tail 6"; horns, in a straight line, 2' 1½"; according to twist 2' 6"; distance of tips 1' 8". Distinguished by the upright spiral formed horns. On account of the variety in the form of the horns, Blyth looks on this *Markhor* as a Goat become wild.

Under the two articles Bœuf and Buffle, in D'Orb. Dict. Univ. d'Hist. Nat. ii., Roulin has given a good Monograph of the genus *Ox*.

He brings them into four groups:—a. Oxen (*Taureaux*); forehead

flat, or even somewhat concave, and almost as broad as high; horns at the ends of the occipital ridge; thirteen pairs of ribs. 1. *B. taurus*: 2. *B. gaurus*: 3. *B. gayal*: 4. *B. banteng*.—*b.* Bisons; forehead broader than high, arched; orbits projecting; horns under the top of the forehead; more than thirteen pairs of ribs. 5. *B. bison* (l'Aurochs): 6. *B. americanus* (le Bison).—*c.* Yaks. 7. *B. grunniens*.—*d.* Buffalo. 8. *B. bubalus*: 9. *L'Arni à cornes en croissant*: 10. *L'Arni geant*: 11. *B. caffer*: 12. *B. brachyceros*. The latter is described according to the same living individual from which Gray had defined his species, but, from growth, it has undergone considerable modification in some of its marks.

Roulin looks on the Gaur, Gayal, and Banteng, as three different species; and from the marks which he gives of their skulls, this seems to be indeed the case. With respect to the Gaur and Banteng, from the plates of their skulls (see our Archiv. v. tab. 9, for the former, and the Nederl. Verh. n. 7, for the latter), there cannot be a doubt but that they are different species; as to the Gayal, there is still a difference of opinion. Whilst Roulin places it as a peculiar species, Delessert, on the contrary, asserts, that the wild oxen killed by him in the south of India, were the same with the Gayal (*B. frontalis s. sylhetanus*), as well as the Gaur; he refers at least for the latter to Hodgson's description; so that it cannot remain doubtful, that at least those wild oxen of this division, extending through anterior India, from Cape Comorin to Nepal, belong to the *Bos gaurus*, whilst the *Bos sylhetanus* of Sylhet and further India must be a different species from it. On this point S. Müller and Schlegel will, perhaps, soon furnish us with the necessary information. What Roulin has communicated on the Bison is the least satisfactory. His knowledge amounts to what Cuvier said of them, and he has made no mention of what has since been published by Bojanus, Jarocki, Brincken, Baer, Pusch, and the reporter, upon this subject. The distinctions formerly given by the reporter between the Bison of the New and Old World, have since been confirmed by the sight of three beautiful Lithuanian specimens set up in Berlin. Their whole body is thickly haired, particularly on the fore part, without, however, any remarkable prolongation of the hair on the sides of the neck; whilst, in the American Bison, the shoulders, neck, and head, are covered with thick curly felt, a foot long on the occiput. In the Lithuanian specimens, also, the ruffs at the posterior margin of the metacarpus, so remarkably well defined in the American Bison, are wanting.

Blyth has given some information about two species of Wild Ox, said to be from the north-west of Africa. It is certainly not sufficient to fix the species (perhaps not even the genus), but still will give an impulse to further investigation. Of the one, a specimen was from the central region of Mount Atlas, and for some months lived at Tangiers; its

country name is *Sherif al Wady*, but the systematic name which it should have, when received into the system, Blyth proposes to be *Bos atlanticus*. The other species, with a flowing nuchal mane (Wadan? Pecasse?) is found, commonly in large herds, about Rabat and Salee, on the Barbary coast. (Ann. ix. p. 62.)

The first division of Ogilby's Monograph of the Hollow-horned Ruminants, mentioned in last year's report, is now completed in the Transact. of the Zool. Soc. 1842, p. 33.

CETACEA.

RÜPPELL looks upon a Dolphin, living in the Red Sea, as a new species, *Delphinus abusalam*, which he distinguishes from *D. tursio* by the number of the teeth, the dorsal vertebræ, and the position of the eye towards the corner of the mouth. (Mus. Senck. iii. p. 140, tab. 12.)

Couch has given a short description, with a plate, which he boasts as being true to nature, of a *Delphinus globiceps* (*Phocæna melas*), twenty feet long, from a specimen caught on the coast of Cornwall. (Ann. ix. p. 371.)

Doumet has given an account of a *Hyperodon*, stranded on the coast of Corsica, in the Rev. Zool. 1842, p. 207, and has added a sketch of it.

Haldeman has been too late with his proposal of giving the Dolphin with two teeth in the under jaw, the name of *Hypodon*, as it has long since been called *Heterodon*. Proceed. of the Acad. of Philadelph. 1842, p. 127.

A short notice has been given in the Instit. 1842, p. 384, of a Fossil Dolphin found in Maryland, *Delphinus calvertensis*.

B I R D S.

BY

PROFESSOR ANDR. WAGNER OF MÜNICH.

THE report on the contributions to Therology has so far exceeded the bounds assigned to it, that the reporter is constrained to abridge the Ornithological division, which he can readily do, by confining himself principally to references; and, indeed, it would require more time than he has at his disposal, for a critical review of all the new species made known during the last year.

In the following enumeration of the general contents of the works to which access has been had, those, as usual, are not separately named; which, from embracing both classes of warm-blooded animals, have already been mentioned in the Therological division.

Nomina Systematica generum Avium tam Viventium quam Fossilium. Auctore L. Agassiz. Recognoverunt Princeps C. L. Bonaparte, G. R. Gray, et H. E. Strickland. Solodur. 1842.

Agassiz goes on briskly with his *Nomenclator Zoologicus*. The Ornithological division has quickly followed the Therological, elaborated by naturalists well fitted for the task. This catalogue is of the greatest utility, for the facility it gives us of finding out the family, under which the new generic names, in a great measure little known, are to be brought. The most difficult part is the etymology, as the more recent dilettanti, in

their manufacturing of genera, have set aside all the laws of nomenclature, and indulged in the most senseless compounds, which no philologist can divine. For instance, the name *Brachypteracias* does not, as is here supposed, derive its concluding syllables from *Brachy*; but the frightful name, as Wiegmann called it, is forged from *Brachypteryx* and *Coracias*, just as *Cypmagra* is from *Cypselus* and *Tanagra*!! Again, *Dacelo* is not a proper or personal name, but Leach coined it by a transposition of the letters of *Alcedo*. There is need of an Illiger to clean this Augean stable!

The 13th volume of the Naturalist's Library, conducted by Sir William Jardine, has been issued. It contains the natural History of the *Nectariniade* or Sun Birds.

In the Rev. Zool. p. 202 and 55, Hartlaub has communicated some observations on Gray's Genera Avium, and contributions to the correction of synonymes. It is much to be desired, that this latter occupation was oftener exercised, and that ornithologists, instead of busying themselves with the defining of new species and genera, would employ their leisure in the critical examination of those already published.

Marcel de Serres, des causes des Migrations des Animaux et particulièrement des Oiseaux et des Poissons.

The Scientific Society at Harlem had selected for a prize essay, What are the causes of the migration of fish, particularly the species which serve for nourishment or other economical purposes? Marcel de Serres of Montpellier, has answered the question to the satisfaction of the Society, and they have published his work in the *Natuurk. Verhandel. van de H. Maatschappij der Wetenschappen te Haarlem*. 2 Deel. Haarl., 1842. It occupies the whole volume. M. de Serres properly took up the general question, and extended his work to all classes of animals of which there are migratory species. The treatise is very interesting, but cannot here be farther discussed in detail.

In the Rev. Zool. 1842, p. 317, attention is called to a little Polish book on fowling, which appeared in the sixteenth century, and has been again published, with a commentary by Ant. Wagu, under the title *Myslestwo Ptasze, &c.* It contains many details on the Birds of Poland.

Several works have appeared on the eggs and nests of birds.

Des Murs has given in the *Mag. de Zool.* 1842, Ois. pl. 22, contributions to an Ornithological Oviography, to be used in the System of Birds, in which he considers form, shell, and colour. He distinguishes six forms, the spherical, oval, cylindrical, ovate, ovato-conic, and elliptic. He also gives an example how these forms are to be systematically employed. Lafresnaye also makes some remarks on the same subject, in the Rev. Zool. p. 302. The eggs of all our *Sarcicolinae* are blue; of all

the *Anisodactylæ* of Europe and America white or slightly flesh-coloured, scattered with dark brick-red spots or points. Most of those species, of all orders, which nest in the hollows of trees, have altogether white or very pale coloured eggs.

To the common remark, that in tropical regions, there are a greater number of birds which build covered nests than in moderate climates, Hill adds his observations, according to which, in the West Indian Islands, the nests, with the exception of those of the Pigeons and Humming Birds, have almost always circular coverings, composed of dry grass, with wool, moss, and feathers interwoven. He imagines that the eggs are thus protected from the many severe hurricanes, as well as from the hurtful effects of electricity and dazzling light. (Ann. of Nat. Hist. ix. p. 145.)

The eleventh number of Berge's Fortpflanzung der Vögel has been published. The plates of the nests and eggs of birds, which belong to Oken's Atlas, are very useful.

Two books of instruction, for the preparation of Birds, fall to be noticed, viz. :—

Brehm, die Kunst Vögel als Bälge zubereiten, auszustoßen, &c. Weim. $\frac{3}{4}$ Thlr. Eick, Anleit. für Naturaliensammler, wie Vögel, Säugthiere, &c., conservirt werden können. Stuttg. $\frac{1}{8}$ Thlr. "Kurze Anweisung, naturhist. Gegenstände einzusammeln und zuzubereiten." This has appeared in the Calwer Vereinsbuch-handlung; and is very useful for collectors in foreign countries.

Kuhlmann, de absentia furculæ in Psittaco pullario. Diss. inaug. Kiel, 1842.

It is remarkable, that in this species, the furcule is constantly wanting, whilst, in the other parrots, hitherto examined, it is always present.

Osteologie der Vogelfüße, von Kessler in Petersburg. (Bullet. de Mosc. 1841, iii. p. 465, and iv. p. 626.)

The reporter willingly confesses, that in consequence of this fundamental and copious work, he resigns a great portion of the species, which in the past year were published as new. The osteology of a part of the body, the form of which has the closest relation with the habits of the bird, is here examined with care; and, at the same time, a very important *point d'appui* has been gained for the classification of birds, as well as for the definition of their fossil species. The author's researches extend over all the orders and families of Birds; and it is only to be regretted, that he did not choose, for his ground work, the system of Nitzsch, which

takes a very complete view of the skeleton, instead of that of Cuvier, which, in regard to Osteology, was not sufficiently elaborated; and in consequence he does not always keep to the natural arrangement. When the author, for example, remarks, that *Cypselus* and *Caprimulgus* do not altogether agree with Cuvier's *Fissirostres*; he, on his side, justifies the separation of these genera from the Swallows, and their complete division from the *Passerinae* first proposed by Nitzsch. Two tables, drawn up with unwearied care and perseverance, show the measurements of the bones of the posterior extremities.

Mayer has communicated, in the *Neuen Untersuch. aus dem Gebiete der Anat. u. Phys. Bonn*, 1842, some observations on a tooth formation in the upper-bill of the foetus of birds, probably destined for gradually rubbing through and breaking the egg-shell. There are also remarks on the presence of the urinary bladder, which is not totally wanting, but in some birds, is distinctly met with even at a later period: And, lastly, he remarks on the use of the Bursa Fabricii as a uterus in the female bird, and as a seminal sac in the male.

E. Weber spoke on the construction of the lungs and the mechanism of breathing in birds, at the Brunswick meeting of Naturalists. (*Amt. Bericht*, p. 75.)

C. Siedhof has imparted his experience on the management of Chamber Birds, particularly Singing Birds, in the *Isis*, 1842, p. 339.

Many contributions have been made to the description of different Faunas. They constitute the most important part of zoographical labours, and are of great consequence in the class of birds, as it is only by a comprehensive knowledge of the principal Faunas, that the extent and direction of the migrations of birds of passage can be ascertained.

The works upon German Ornithology by Naumann, Susemihl, Bekker, and Zander, have been continued. Brehm has continued his account of several trips to Brinnis at Delitzsch, and, as a good observer, has made many interesting remarks with regard to Zoology, and in particular to Ornithology, which the reporter would extol the more, as he confesses himself at variance with the unhappy multiplication of species.

C. Th. v. Siebold has published new contributions to the Vertebrated Fauna of Prussia. (*Preuss. Provinzial Blätter*, 1842, Bd. 27, p. 420.) At first he gives an account of a MS. left by Klein, "*Aviarius Prussicum*," as well as of a set of drawings belonging to it. He next discusses some rare species which occur in it, namely, *Fulco candicans*, *Alda alpestris*, *Ardea egretta*, *Podiceps arcticus*, and *auritus*, appending some observations of his own. *Sylvia locustella*, never till now mentioned as a Prussian Bird, was found by Siebold, in the summer of 1840, at Heubude, in the wild garden of Biörn. It is worthy of attention also, that in April, 1838, a flight of Rooks entered into the city of Danzig, and settling upon all the larger trees, in gardens as well as in the most

crowded streets, built their nests there and brooded. He farther remarks, that judging from an oil painting, a *Pelecanus onocrotalus* was shot in Prussia, in the year 1608. Finally, he gives an interesting description of the Sasper-lake at Danzig, on which numerous water-fowl brood in great security, but which he surprised in a boat. *Larus ridibundus* is most abundant. In the nestlings of the *Sterna nigra*, he remarked a chalky white spot on the tip of its otherwise black bill.

The first attempt at an enumeration of the Birds of Siebenbürgen has been made by Landbek in the *Isis*, p. 181. Though the author himself confesses the incompleteness of his list, yet he has already mentioned 261 species. There is an interesting description of the *Reiherinsel* at Adony in Hungary, by the same author (*Isis*, p. 267). Andree's Öfversigt af Gottland's Fåglar, in the K. V. Acad. Handl. för 1841, p. 207, is a valuable contribution to the knowledge of the geographical distribution of the European species. In C. J. Sundevall's Remarks on Scandinavian Ornithology (l. c. År. 1840, Stockh. 1842, p. 31), there are mentioned:—a. Birds accidentally present. 1. *Turdus varius*: 2. *Fringilla erythrina*: 3. *Columba turtur*: 4. *Otis tetrax*.—b. Scandinavian species. 5. *Alda alpestris*: 6. *Anthus pratensis*: 7. *Motacilla flava*: 8. *Emberiza citrinella*: 9. *Fringilla linaria*. The second division is particularly valuable, from the separating of the varieties and their distribution, to which we shall return at a later period. L. Schrader has furnished a List of Birds in the high north regions of Scandinavia, in the *Isis*, p. 616.

The reporter takes this occasion of drawing attention to some Swedish copper-plates, which, however, are merely known to him from Sundevall's report, in his Årsberätt. om. Zool. arbet. p. 540, namely,—1. Svenska Foglar af bröderna v. Wright, which, as Sundevall asserts, excel all other works, native or foreign, in faithful delineation; and not only are the exterior covering of the feet and bill admirably represented, but also the feathering and posture of the bird (30 Nos., each 2½ Rdr. Bko., with 6 plates). 2. Körner Skandinaviska foglarne, mit kol. fig. (6th part, 1841). 3. J. Ad. af Ström Svenska foglarne, mit kol. fig. (6th part, 1841). 4. J. Ad. af Ström Svenska foglarna, 100 Sid. med. 9 pl. af W. v. Wright. Stockh. 1839. 5. Svenska Colorerade fogelägg af J. D. Högbeg (1st part, Stockh. 1840).

W. Thompson has continued his description of the Birds of Ireland, in the Ann. of Nat. Hist. ix. p. 141, 221, 373, and x. p. 50, 171, and has got as far as *Caprimulgus*. II. L. Meyer's Illustrations of British Birds and their Eggs, N. I. Lond. 1842, 8vo., is a smaller edition of the same author's larger work in 4to. The Naturalist's Library, vol. 34 (1842), contains the third volume of British Birds, by Sir. W. Jardine.

The Faune Belge, par E. de Selys Longchamps, is rich in personal observations on the Belgian Birds, and contains a tolerably complete

classification, which, however, being founded only on external characters, cannot be considered as a step forwards in the ornithological system.

Th. Cantor has found the following birds on the Chinese Island Chusan :—*Lanius erythronotus*, *Dicrurus balicassius*, *Turdus merula*, *Philædon* sp., *Sylvia hypoleis*, *Hirundo erythropygia*, *Pyrgita montana*, *Pastor cristatellus*, *Pica vulgaris*, *Alcedo bengalensis*, and *Ardea* sp. (Ann. ix. p. 482.)

The reporter is only acquainted with the title of T. C. Jerdon's Catalogue of the Birds of the Peninsula of India, Madras, 1839, and of his Illustrations of Indian Ornithology, to be published in fifty coloured plates (Ann. ix. p. 242).

A description of several Abyssinian Birds, mostly new, of the order of Climbers, by Dr. E. Rüppell, consisting of ten species, will be mentioned in its proper place.

Two numbers of A. Smith's Illustrations of South Africa, the 15th and 16th, have been received in the past year.

The Birds of America, from drawings made in the United States and their territories, by J. J. Audubon, vol. ij. 1842, is at present only known to me, from a copious notice in Silliman's Amer. Journ. xlii. p. 130, from which the following is borrowed :—Since the completion of his first volume, Audubon has obtained 395 new subscribers, the half of whom are from the city of Boston alone, so that his work now numbers almost a thousand; a case of liberal support, to a work on Natural History, without a parallel in the New World, and hardly even in the Old: at least there is no parallel to it in South Germany. This second volume contains 70 plates, with 136 figures of birds, besides a great number of etchings of plants, nests, insects, &c., and with the text, cost 14 dollars (about 2½ fl.), which is a reasonable price. There are seventy species of birds represented, twenty-six of which are not to be found in the work of Wilson, and seventeen in no other work on American Ornithology. Townsend's List of the Birds of the Rocky Mountain Region, the Oregon district, and the north-west coasts of America, is valuable to compare with the eastern species (Journ. of the Acad. of Nat. Sc. of Philad. viii. p. 151). A list of some birds, collected by Bridges in Chili, is contained in the Ann. ix. p. 509.

Numbers 6, 7, 8 and 9, of Gould's Birds of Australia, have appeared during the last year, and this splendid work is making rapid progress.

ACCIPITRES.

BREHM, who, as he mentioned in the *Isis*, 1842, p. 418, was very naturally astonished, that the Condor stood alone without sub-species, has had the happiness to trace out and distinguish two sub-species.

1. *Sarcoramphus gryphus*, Linn.; much larger than *Vultur cinereus*. In old age both sexes have a silver-white band of an inch in breadth, passing through above the white shield of the wings: 2. *S. condor*, Br.; size of the *Vultur fulvus*. Both sexes in old age have a silver-white wing-shield, over which there is no white band, or at least only an imaginary one.

Brehm has added a new species to his Vultures, formerly described in the *Isis*, p. 509, *Vultur isabellinus*, which he distinguishes by the Isabella colour from similar Vultures, and which must belong to the West of Europe.

Lafresnaye, in the *Rev. Zool.* p. 173, has quite unnecessarily made a particular genus, *Harpyhaliaetus*, from the *Harpyia coronata*, Vieill. Lesson (*ibid.* p. 378) has distinguished another genus, with the name *Carnifex*, which Sundevall had already bestowed upon a *Pipra*: in its principal marks, it is like *Herpetotheres*, but differs by its long and strong tarsi, and the shortness of its wings, in proportion to the length of its tail. He adds to it a new species, *C. naso*, from Central America.

Brehm has been successful in dividing our Osprey into five species—

1. *Pandion alticeps*, Br.: 2. *P. medium*, Br.: 3. *P. planiceps*, Br.: 4. *P. albigulare*: 5. *P. fasciatum*. (*Isis*, p. 425.)

The following species of Eagles are represented in Gould's Birds of Australia, parts 6-9:—*Aquila fucosa*, Cuv., and *A. morphnoides*, Gould (both in part 7); *Buteo melanosternon* (part 9); *Elanus axillaris*, Lath., and *E. scriptus*, Gould (*ibid.*); *Accipiter torquatus*, Cuv., (part 6); *Astur approximans*, Vig., and *A. cruentus*, Gould; *Milvus affinis*, Gould (part 6). None of these species are new, as even those described by Gould were characterized by him previously in the Proceedings of the Zoological Society.

A. Smith has represented two species of Owls, in the Illustrations of South Africa, No. 15.

1. *Bubo capensis*, Smith; a young specimen, whose specific difference from our Screech-owl is not yet proved: 2. *Athene Woodfordi*, Smith: supra rubro-brunea, maculis fasciisque albis notata, infra pallide rubro-brunea, fasciis albis variegata; cauda rubro-brunea, 7-8 fasciis pallide flavo-bruneis, rostro pedibusque flavis; length 13½".

PASSERINÆ.

C. SUNDEVALL drew the attention of the meeting at Brunswick, to the fact, that he had already, in his Ornithological System, published in the Transactions of the Swedish Academy for the year 1835, given a clearly defined character for the order of Singing Birds as comprised by Nitzsch. (Amtl. Bericht über die 19te Vers. deutscher Naturf. Braunsch. 1842, p. 78.)

In all Singing Birds, the tectrices alarum are so short, that the larger of them do not reach the middle of the wing-feathers of the second order, and end in the middle of the breadth of the wings. In all birds which have no muscular apparatus for singing, these tectrices are much longer and more numerous, so that the smaller ones reach about as far as the larger ones in the Singing Birds, and the larger stretch out far over the middle of the wing-feathers of the second order, constituting quite a different form of the wing and of the whole bird. The following birds only appear deviating or doubtful:—1. *Menura* has the wings of a Singing Bird, but a different formation of foot: 2. *Upupa* has the wings of a Singing Bird, but no muscular apparatus for singing: 3. The Speckled Woodpeckers approximate to the Singing Birds in wing-formation.

CORVINÆ.—Hodgson distinguishes a new genus of *Crypsirhina* and *Dendrocitta*, CONOSTOMA, with a more compressed bill, and founds it upon a species, *C. amodius*, also held as new, from the neighbourhood of the snowy region of Nepal. At the same time, Hodgson remarks,* that 850 species of birds are known to him from Nepal. (Ann. x. p. 77.)

Lafresnaye has given the name of *Pica San-Blasiana*, in the Mag. de Zool. Ois. pl. 27, to the species defined by Neboux as the *Geai de San-Blas*, and has added a drawing of it.

The reporter remarks, that his *Corvus infumatus*, and Hedenborg's *C. umbrinus* (see Annual Report, 1839-40), are identical, according to an immediate comparison which Natterer had an opportunity of making. Sundevall's description, "capite colloque grisescentibus," must, therefore, be corrected, as it leads to misconception.

AMPELIDÆ.—Lesson has described a *Pipra fastuosa*, in the Rev. Zool. p. 174: habitat, Realejo in Central America.

Hartlaub has remarked, *ibid.* p. 56, that *Euphonia cœlestis*, Less., and *Pipra elegantissima*, Bonap., belong to one species; again, p. 203, that *Minla ignostincta*, Hodg., is = *Leiothrix ornata*, Horsf., and *Civa cyanouroptera* = *L. lepida*, Horsf.

TANAGRIDÆ.—Lesson has given two species of *Tanagra* as new, in the *Rev. Zool.* p. 175.

Aglaia diaconus and *Euphonia affinis*, both from Realejo. His *Pitylus lazulus* is also from Central America. Lafresnaye has added two new species to *Cyclorhis* (*Laniagra*), hitherto founded merely upon the *Tanagra guianensis*, viz., the *C. flaviventris*, from Santa-Cruce in Mexico; and *C. nigrirostris*, from Columbia. Azara's *Habia vert* he looks upon as identical with *Tanagra guianensis* (*Rev. Zool.* p. 134). An *Arremon atropileus*, and a *Tachyphonus Victorini*, both from Bolivia, are also described by him (*op. cit.* p. 335). A description of the *Pyranga leucoptera* of Trudeau, from Mexico, is to be found in the *Journ. of Philad.* viii. p. 160.

FRINGILLIDÆ.—Landbæk asserts, in the *Isis*, p. 90, that *Fringilla cisalpina* and *hispaniolensis* are only varieties of our House Sparrow.

F. cisalpina was distinguished from it by not being present on this side of the Alps; he found it plentiful in Under Engadin, Canton Grisons. Among the Sparrows which he shot on the roof of the inn, were some Italian ones, some birds of passage, and some common Sparrows. In the newly fledged young ones, and in the adult female, he could discover no difference from the common ones. In voice, habits, nest, and eggs, no difference was observable between the two sorts: As it is now observed, that amongst *F. hispaniolensis*, the young males, especially, completely resemble our own; so Landbæk regards those southern Sparrows not as peculiar species, but only varieties of one and the same.

Sundevall distinguishes two varieties of *Fringilla linaria*, in the *K. Vet. Acad. Handl. för 1840. Stockh. 1842*, p. 56.—Var. *a.* (*Linaria alnorum et Holboelli*, Brehm); rostro majusculo, basi tantum plumis tecto, altitudine 7, longitudine ad summum angulum frontalem 11–12 millim.; macula gulæ nigra longitudine rostri vel ultra. Var. *b* (*Linaria betularum*, Brehm); rostro parvo, ultra medium plumulis tecto, altitudine 6, longit. ab. ang. frontis 8–10 millim.; macula gulæ parva (longit 5–6 millim.). Besides this, Sundevall remarks, that var. *a.* is larger, with the forehead more compressed and blackish; var. *b.* is smaller, with the forehead high arched and greyish.

Hartlaub asserts, in the *Rev. Zool.* p. 56, that *Carduelis rufogularis*,

Less., is identical with *Fringilla thoracica*, Ill., and *Pipilo ruftorques*, Swains.; *Pyrgita peruviana*, Less., with *Fringilla matutina*, Licht.; *Pyrrhula cruentata*, Less., with *Fringilla hamorrhoa*, Wagl. (*Pyrrhula frontalis*, Say, and *Erythrospiza front.*, Bon.); also *Coccothraustes fortirostris*, Lafr., with *C. melanoxanthus*, Hodg.; *Loxia prasipteron*, Less., with *Spermestes cucullata*, Swains.; *Pitylus guttatus*, Less. (*Guiraca melanocephala*, Swains.), with *Fringilla xanthomaschalis*, Wagl. Lesson's *Coccothraustes carneus* comes from Acapulco. (Rev. Zool. p. 210.)

Callyrhyncus was separated by Lesson, in the Rev. Zool. p. 209, as a genus among the *Pyrrhulinae*.

Bill strong, very high, convex, crooked, much compressed sideways; upper mandible much curved, narrow, pointed; ridge of beak convex, dividing the frontal feathers, bordered on each side by a groove, from which rises the swollen lateral corneous plate; nostrils round, bare, placed at the margin of the frontal feathers, and covered by a few hairs; under mandible much compressed sideways, swollen in the middle and beneath; tail moderate, pretty straight, &c. The new species is called *C. peruvianus* from Callao.

Lafresnaye also has established a separate genus amongst the *Fringillidee*, to which he gives the name of CATAMBYRHYNCHUS. (Rev. Zool. p. 301.)

Rostrum breve, arcuatum, valde compressum, maxillæ carina supra planulata, utrinque linea impressa marginata, apice obtusa, rotundata. Lafresnaye has established this genus from the peculiar formation of the bill, which rests upon a newly discovered species, *C. diadema* from Columbia.

Gould, in his Birds of Australia, has represented the following species of this family:—*Estrilda temporalis*, Lath. (part 6); *E. ruficauda*, Gould, (part 7), and *E. phaeton*, Hombr. (part 8); *Emblema picta*, (part 7); *Donacola castaneothorax*, Gould, and *D. pectoralis*, Gould, (part 7); *Poëphila acuticauda*, Gould, *P. personata*, Gould, *P. cincta*, Gould, (part 6).

Brehm has now brought the Lark of the Desert (*Phileremos*), founded on *Alauda alpestris*, into five species. (Isis, p. 502.) He has been still more successful with the Yellow Hammer, which he has divided into no fewer than eight sub-species, of which he has given very full descriptions, with some interesting remarks on their habits. (Isis, p. 752.)

Emberiza hortulana, which, according to Bujack, is extremely rare in Prussia, has been found by M. Rosenheyn pretty frequent on the bushy banks of the Weichsel; and at Culm is a very common bird. (Preuss. Provinzial Blätter. 1842, p. 232.)

DENTIROSTRES.—Brehm, after dividing the *Lanius minor* into five, and the *L. collurio* into seven sub-species, in the Isis, p. 652, gives a copious history of the habits of both these species. Hartlaub asserts, in the Rev. Zool. p. 57, that *Malacornotus aurantiopectus*, Less., is identical with *M. chrysogaster*, Swains.; also *Pycnonotus niveoventer*, Less., with *Graucalus pectoralis*, and *Pycn. carbonarius*, Less., with *Cebelpyris lugubris*, Sundev.

Delessert, in his Souv. d'un Voy. à l'Inde, p. 24, asserts his *Muscicapa variegata* to be identical with *Siva strigula*, Hodgs., and has given a drawing of it on tab. 8. A short description has been given of *M. rufula*, Lafr. Hartlaub has defined, as identical species (Op. sup. cit.), *Platyrhynchus pseudogilla*, Less., and *Muscicapa mystacea*, Spix (*Fluvicola cursoria*, Sw., (*Enanthe climazura*, Vieill.)); also *Muscipeta lapis*, Less. = *M. melanops*, Vig., of which *M. thalassina*, Sw., will be the female; *Muscicapa bilineata*, Less. = *Acanthiza arrogans*, Sund.; *Setophaga castanea*, Less. = *Muscicapa vulnerata*, Wagl. Lafresnaye has found a second species of *Copurus*, *C. leuconotus*, from Bolivia (Rev. Zool. p. 335). Lesson's *Psaris tityroides* comes from Central America. (Ibid. p. 210.)

Gould, in his Birds of Australia, part 6, has figured six species of *Artamus* (*Ocypterus*); *A. sordidus*, Lath., *cinereus*, Vieill., *minor*, Vieill., *superciliosus*, G., *personatus*, G., and *leucopygialis*, G.

SUBULIROSTRES.—A specimen of the *Turdus varius*, Pall., was killed in Sweden (Jemtland) in the year 1837, and described by Sundevall in the K. Vet. Acad. Handl. p. 36. The reporter takes this opportunity of observing, that another specimen was shot in Steiermark last harvest, and sent to the Vienna Cabinet. *Turdus nigropileus*, Lafr. is described by Delessert in his Souvenirs, p. 27. Hartlaub, Rev. Zool. p. 58, defines *T. collaris*, Sor., as identical with *T. albocinctus*, Royl.; *Petrocincla ferrugineoventer*, Less., with *P. rufiventris*, Jard.; *Ixos plumigerus*, Lafr., with *Brachypus leucogenys*. As the name *Crateropus Delessertii*, Lafr., was already given by Jerdon to another species, Delessert has now defined it in his Souv. p. 28, as *Cr. Lafresnayii*. *Sibia nigriceps*, Hodgs. = *Cinclosoma capistratum*, Vig. (Hartl. in the Rev. Zool. p. 202). *Timalia pterilorhyncha*, Lafr. = *T. subrufa*, Jerdon. (Deless. Souv. p. 28.)

Townsend has pointed out, in the Journ. of the Acad. of Nat. Sc. of Philad. viii. p. 149 and 159, that the bird drawn by Audubon, as *Sylvia philadelphia*, is very different from a species found by him at Columbia River, and to which he gave the name *S. tolmiei*: afterwards, when Audubon perceived his error, he gave it the name of *S. Macgillivrayi*. Brewer has corrected, in Sillim. Amer. Journ. xlii. p. 132, many mistakes of Audubon in the definition of the American *Sylvia*. *Muscicapa Selbii*, Aud., is the young of *Sylvia cucullata*, Wils.; *Syl. Vigorsii*, Aud., the

young of *S. pinus*; *Syl. rara* is the young male of *S. azurea*; *S. palmarum*, Bon., is identical with *S. petechia*, Bon.; *S. pusilla*, Wils. and *S. sphagnosa*, Aud., are identical with *S. canadensis*; *S. tigrina*, Bon., does not agree with that of Latham, but with *Syl. montana*; *S. Roscoei* is the young of the common Maryland Yellow Throat; *S. Childrenii*, Aud., is the common Summer Yellow Bird not completely feathered, which broods in this state.

Of the genus *Drynoica*, A. Smith has given, in the Illust. of the Zool. of South Africa, No. 16, the description and drawings of *D. substriata*, *pallida*, *ruficapilla*, *Le Vaillantii*, *tetrix*, and *terrestris*.

The Wagtails (*Budytes*) have now been extended by Brehm to ten species. (Isis, p. 511 and 566.)

They are called—1. *B. atricapillus*, Br. (*Motacilla melanocephala*, Licht.): 2. *B. melanocephalus*, Boje. (*M. melanocephala*, Licht.): 3. *B. Feldeggii*, Mich.: 4. *B. cinereo-capillus*, Savi: 5. *B. caniceps*, Br. (*M. cinereo-capilla*, Auct.): 6. *B. megarhynchos*, Br. (*M. flava*, Auct.): 7. *B. boarulus* (*M. boarula*, Linn.): 8. *B. chrysogaster*, Br. (*M. flava*, Linn.): 9. *B. flavus* (*M. flava*, Linn.): 10. *B. flaveolus*, Temm. (*M. flava*, Gould). Brehm himself confesses, that the distinction between Nos. 2 and 3 is very difficult, and between 3 and 5 still more so; when young, perhaps quite impossible: it is not possible to come to a conclusion, as he says, without examining the shape of the bill and head. But if the species admit of slight variations in the colour, why should it not also do so in the form of the head and bill? Selys Longchamps mentions, in his Faune Belge, p. 88, five Yellow Water Wagtails,—1. *Motacilla flava*: 2. *M. cinereo-capilla*: 3. *M. melanocephala*: 4. *M. flaveola*: and 5. *M. boarula*. The *M. cinereo-capilla*, of which he shot a specimen at Lüttich, he is inclined to suppose a southern race of *M. flava*. Sundevall, in the K. Vet. Acad. Handl. Stockh. 1842, p. 47, divides the *Motacilla flava* into five varieties:—Var. 1. (*Anglica*, *M. flaveola*, Temm.); capite semper virescente, colore dorsi: Var. 2. (*Vulgaris Suecana*); dilutior, pure læteque colorata, superciliis perfectis, latis, lora fere implentibus limboque gulari lato pure albis. Maculæ colli pectorisque pallidiores fusæ: Var. 3. (*Borealis e Lapponia*); obscurior paullo sordidius colorata, loris definite nigris, limbo gulari colore juguli; maculæ colli pectorisque distinctæ, obscuriores; apices tectricum ex fuscescente sordidæ. ♂ caput obscure canescens, lateribus pure nigrum; vetus superciliis plane nullis, fronte verticeque fere nigris: Var. 4. (*Dalmatica*, Bruch., *M. Feldeggi*, *M. cinereo-capilla*?) Var. 5. (*Africana*, *M. melanocephala*, Licht.)

The reporter would rather recognise local varieties than different species in the described deviations of *Motacilla flava*:

CERTHIPARUS is a new genus of Lafresnaye, founded on *Parus senilis*, Dub. (Rev. Zool. p. 69.)

He regards it as an intermediate genus between the Tit Mice and Woodpeckers; resembling the latter from its rigid tail, with somewhat outwardly turned feathers at the sides; and the former from the shape of the bill, feet, and whole form. On these accounts, in the reporter's opinion, it ought to be reckoned with the Tit Mice. The *Parus nov. zelandiæ*, Lath., as Lafresnaye thinks, might be added to the *Parus senilis*, yet its tail is not stiff, though it has the same form. But this is, as the reporter adds, a farther and certainly very striking proof, that the genus *Certhiparus* is quite untenable. Hartmann has (in the Rev. Zool. p. 75) defined the *Orthonyx heteroclitus*, Lafr., which is allied to this, as identical with *Muscicapa chloris*, Forst. Leon., ined. tab. 157, *M. ochrocephala*, Lath.

Sundevall has divided the *Anthus pratensis* into three varieties,—1. Var. *Vulgaris*; gula alba, striola nigricante utrinque a basi maxillæ inferioris: 2. Var. *Cervina* (*Motacilla cervina*, Pall.); gula juguloque fulvis, stria laterali ad latera juguli nulla evidentem nigro-maculata; cauda et alæ breviores. A specimen was shot in East Finnmark in 1837: 3. Var. *Ruficularis*, Br.; superciliis, gula juguloque saturate ex griseo rubicundis, striola gulæ nulla, cauda et alæ longiores.

Lesson characterizes two species of *Megalonyx*, which he names *M. nanus* and *ruficapillus*, both from the island Chiloe, on the coast of Chili (Rev. Zool. p. 135 and 209). Lafresnaye now numbers nine species of *Grallaria* (ibid. p. 333); among them, *G. ruficapilla* is a newly added species from Bolivia.

Gould, in his Birds of Australia, has given plates of *Ephthianura albifrons*, Jard. (part 6); *E. aurifrons*, G., and *tricolor*, G. (part 7); *Drymodes brunneopygia*, (part 8); *Petroica multicolor*, Vig., *Goodenovii*, Vig., *phænicea*, G., *bicolor*, Sw., *fusca*, G. (part 8); *Erythrodys rhodinogaster*, Drap., and *rosca*, G. (part 8); *Pitta strepitans*, Temm., and *iris* (part 6).

CERTHIACEÆ.—New species: *Dendrocolaptes triangularis*, Lafr., from Bolivia (Rev. Zool. p. 134); *Picolaptes capistratus*, Less., from Realejo (ibid. p. 174); *Tatara* (*Sitta*) *fuscus*, Less. (ibid. p. 210); *Conirostrum albifrons* and *cæruleifrons*, Lafr., from Columbia (ibid. p. 301).

Hartlaub has remarked, that the genus *Uncirostrum*, Lafr., had previously received the name *Diglossa* from Wagler. He points out six species (Rev. Zool. p. 569).

Delessert mentions, in his Souv. p. 23, tab. 8, that *Chloropsis auri-ventris*, Del., is identical with *Chl. curvirostris*, Sw. Hartlaub, however, had mentioned the same before in the Rev. p. 58. The *Acanthiza tenuirostris* was used by Lafresnaye for the formation of a new genus, and drawn in the Mag. de Zool. Ois. pl. 27.

HIRUNDINACEÆ.—Landbek has given some valuable observations on *Hirundo rupestris* in the Isis, p. 97. The New Holland Swallow, which Vigors and Horsfield had comprehended under one species with *Hirundo javanica*, has been separated from it by Gould, and defined as *H. neo-oxena*, (Birds of Australia, part 9). In the same part are given *Atticora* (*Hirundo*) *leucosternon*, G., *Collocalia ariel* and *arborea*.

CLAMATORES.

MACROCHIRÆ.—Townsend has discovered a new Swift at Columbia River.

He names it *Cypselus Vauxii*, and distinguishes it from *C. pelagicus*, with which it may be confounded, from its lighter colour and much smaller size; only $3\frac{1}{2}$ " long: (Journ. of the Acad. of Philad. viii. p. 148.)

Hartlaub (Rev. Zool. p. 58), and Delessert (in his Souv. p. 25, tab. 9), have mentioned, that *Cypselus leuconotus*, Del., is identical with *Chætura nudipes*. *Cypselus australis* has been represented by Gould in the Birds of Australia (part 9); *Acanthylis caudacuta*, Lath. (ibid.)

Bourcier has described, in the Rev. Zool. p. 373, three species of Humming-birds from Columbia, by the names of *Ornismyia Aline*, *Julie*, and *Mulsant*. Lesson has given the name of *O. cinnamomea* to a fourth species from Acapulco (ibid. p. 175). Longuemare has given a drawing of his *O. Clarisse*, in the Mag. de Zool. N. 23.

CAPRIMULGINÆ.—*Eurostopodus* (*Caprimulgus*) *alligularis*, Vig., and *guttatus*, Vig., have been represented by Gould. (Op. sup. cit. part 9).

TODIDÆ.—Gould has given a plate of the *Merops ornatus*, Lath. (part 7). According to Hartlaub's statement, *Alcemerops paleazureus*, Less., is = *A. Athertoni*, Jard. = *Nyctiornis ceruleus*, Sw. = *N. amherstianus*, Royl. = *Bucia nipalensis*, Hodgk. (Rev. Zool. p. 58.)

LIPOGLOSSÆ.—Brehm, in the Isis, p. 488, has divided the European Hoopoe into four sub-species—*Upupa bifasciata*, *macrorhynchos*, *epops*, and *brachyrhynchos*. From observation of a live specimen, he thinks that this genus must be added to the Earth Woodpeckers. There is a beautiful plate of *Buceros cassidix*, fem., in the Nederl. Verhandl. n. 7. *Todiramphus recurvirostris*, Lafr. (Rev. Zool. p. 134), was brought from the South Sea, and is the third species of this genus.

Strickland has lately proved, that *Alcedo smyrnensis*, Linn., is actually to be found in Asia Minor (Ann. of Nat. Hist. ix. p. 441). Two species of *Prionites* have been described by Lesson, from Central America; *Crypticus* (*Hylomayus*) *apiaster*, and *Momotus Lessonii* (Rev. Zool. p. 174).

ZYGODACTYLI.

RÜPPELL, in the Mus. Senckenb. iii. p. 127, has given a list of the Climbing Birds observed by him in the north-east of Africa.

They are as follows:—*Picus præcephalus*, *schoënsis*, *Hemprichii*, *æthiopicus*, and *abyssinicus*; *Yunx torquilla*, and *aquatoralis*; *Cuculus canorus*, *solitarius*, *serratus*, *asér*, *Claasii*, *cupreus*, and *auratus*; *Coccyzus glandarius*; *Centropus senegalensis*, *superciliosus*, and *monachus*; *Indicator archipelagicus*, and *minor*; *Bucco chrysozonicus*; *Micropogon margaritatus*; *Pogonias levirostris*, *melanocephalus*, *Vieillotii*, *Brucei*, and *undatus*; *Trogon narina*; *Pittacus rufiventris*, *flavifrons*, *Meyeri*, *Le Vaillanti*, *taranta*, and *cubicularis*; *Corythæix leucotis*; *Chizærhis zomura*, *personata*, and *leucogaster*. In all, thirty-eight species, of which twelve were discovered by Rüppell.

CUCULINÆ.—Rüppell has clearly shown (Op. ant. cit. p. 122), that *Cuculus serratus* of the Cape and Abyssinia, is a different species from the *C. melanoleucos* of India. He has also given a minute description of Le Vaillant's *Cuculus solitarius*, which is also found in Abyssinia as well as at the Cape.

W. Thompson has mentioned, in the Ann. ix. p. 225, four instances of the presence of the *Coccyzus americanus*, Bonap., in the British Islands.

Lesson, in the Rev. Zool. p. 210, has defined the *Coccyzus erythropygus* of San-Carlos, in Central America, as a new species.

Gould has circumstantially described, in the Ann. ix. p. 237, two new species of *Trogon* from the Cordilleras:—1. *Trogon personatus*, very like the *Trogon atricollis*, but the abdomen is scarlet instead of orange: 2. *Tr. (calurus) auriceps*, allied to the *T. pavoninus*, but larger; bill bright yellow; wing-coverts longer, &c.

Lesson has described a third species from Realejo in Central America, as *Trogon capistratus*, and appended a description of the male of *Tr. mexicanus*, Sw. (Rev. Zool. p. 135.)

BUCCONIDÆ.—Hartlaub has described a *Bucco malaccensis*, allied to the *B. armillaris*, but differing from it by the light blue throat, red cross-bands on the anterior part of back, want of the orange coloured breast-bands, &c. At the same time, he enumerates the species of *Bucco* particularly, and brings their number up to twenty-three. (Rev. Zool. p. 336.)

Rüppell (Op. ant. cit. p. 124) has discovered that the southern provinces of Abyssinia are the habitat of the *Pogonias levirostris*, a fact not previously known.

RHAMPHASTIDÆ.—The third number of Gould's Monograph of the *Rhamphastidæ*, translated by J. H. Chr. Fr. and J. W. Sturm, has appeared.

This third number has not yet been sent to our State Library, and therefore is not accessible to me at present.*

Gould, in the Ann. ix. p. 238, has given the name of *Pteroglossus (Aulacorhynchus) castaneorhynchus* to a new species from the Cordilleras, standing next the *Pt. hamatopygus*, but differing from it and all other species by its much larger size (18").

PICINÆ.—Rüppell, in the Mus. Senckenb. iii. p. 119, has increased this family with two species.

1. *Picus (Dendobratus?) schoënsis*, very like the *P. biarmicus*, but larger, the two white streaks on the sides of the head not uniting, &c.: from Schoa. 2. *Yunx æquatorialis*, from the Southern Provinces of Abyssinia. Hitherto there were only two species known in the Old World, viz., *Y. torquilla* of Europe and North Africa, and *Y. pectoralis* of South Africa. This new third species corresponds in size with the Northern; and is near the South African by the rusty red of the under side of the body, which, however, is differently disposed or divided. Rüppell has appended to these two species the description of a female *Picus poecephalus*, Swains.

On a review of the Speckled Woodpeckers (Isis, p. 649), Brehm believes he has found out, that the smaller species of *Picus* may be separated into a particular genus, which should be called *Piculus*. Their chief mark is the tail, which is not so wedge-shaped as in the other Woodpeckers, but is much blunter. They are also particularly distinguished by a black and white banded back, and the females have probably no red, but only black upon the top of the head: this, at least, is the case in the *Picus minor*, *Macei*, *moluccensis*, and *concretus*. This separation may be very good, but the name *Piculus* has already been used by Is. Geoffroy as identical with *Picumnus*. Brehm has announced a sub-species of the *Picus*, in the meanwhile, as *P. roseiventris*.

Hartlaub has remarked, that *Picus luridus*, Nitzsch, is synonymous with *P. tukki*, Less., and *Hemicercus brunieus*, Eyt. (Rev. Zool. p. 57.)

PSITTACINÆ.—Chr. L. Brehm, Monographie der Papageien. Fol. das Heft Mit. 10 ill. Abbild.

After the copper-plates of Parrots by Le Vaillant and Bourjot St.

* In the fifth number of the Archives of last year, I have given a notice of this number, and drawn attention to its increasing value in original observations, additions, and improvements.—EDITOR OF ARCH.

Hilaire, it is a doubtful matter to publish others, as the great libraries have no need of such a work, and will delay the purchase until convinced, that after the publication of the first number, it is not given up, as happens in so many cases. Should science need such an undertaking, the author (at whose command, indeed, must stand the whole ornithological literature of this family, and a great collection), promises to give a critical description of all the species hitherto known, with plates of those which have not been previously represented.

Rüppell, in the Mus. Senckenb. iii. p. 125, has made known to us two new species of Parrots: 1. *Psittacus (Pionus) rufiventris*; in size and form of tail resembling the *Ps. senegalus*, and also approaching it in the distribution of the principal colours, but having a much stronger bill: from Schoa: 2. *Ps. (Pionus) flavifrons*; about 1-6th larger than *Ps. Meyeri*; fore-part of head and region of eyes beautiful citron yellow; the rest of plumage different shades of green: from the Abyssinian province of Godjam.

*Psittacus (Amazona) auro-palliatu*s of Realejo, *Arara erythrofrons* of Valdivia, *Ps. (Caiica) chrysopogon* of San-Carlos, and *Ps. (Aratinga) eburnirostrum* of Acapulco, have been described by Lesson in the Rev. Zool. p. 135.

The following species are represented in the new parts of Gould:—*Nymphicus nova hollandiæ* (part 7); *Aprornictus scapulatus*, Bechst., and *erythropterus*, Gm. (part 8); *Trichoglossus Swainsonii*, Jard., *rubritorquis*, Vig., and *versicolor*, Vig. (part 9).

AMPHIBOLÆ.—Rüppell has made known, in the Mus. Senck. iii. p. 127, two new species of *Chizærhis*, from the southern provinces of Abyssinia.

1. *Ch. personata*; regione ophthalmica, genis, mento et gula pennis denudatis, pileo crista plicatili plumis laxis elongatis colore murino; nucha, regione parotica juguloque albidis, jugulo et pectore viridiglaucis, abdomine et tibiis rufocervinis, auchenio, dorso et alis cæsiombrinis, rectricibus olivaceis; cauda elongata, subrotundata, supracinerea, infra luteo-virente; 19". 2. *Ch. leucogaster*, pileo, crista plicatili, plumis apice truncatis; capite, gutture, collo, cervice, dorso et alis ex cæsiombrinis; tectricibus mediis nigro-marginatis, remigibus dimidio basali albis, apicali umbrino-nigris; cauda subrotundata, nigra, fascia lata alba transversa, rectricibus 2, intermediis ex cæsiombrinis, abdomine et tibiis albis; 18½".

Chizærhis feliciæ = *Ch. concolor*, Smith. (Rev. Zool. p. 56).

COLUMBINÆ.

Geophaps Smithii, Jard., *plumifera*, G., and *scripta*, *Ptilinopus Swainsonii*, G., and *Ewingii*, G., have been represented by Gould in the 7th part of his *Birds of Australia*. Both species of *Ptilinopus* have been hitherto united under the name of *Columba purpurata*, and they agree in the distribution of colour; but the *Pt. Ewingii* is smaller, the top of the head rose-red instead of crimson, the breast pale greenish-grey, instead of muddy green, the middle of abdomen bright orange, instead of lilac; and the tail-feathers greenish-yellow instead of being tipped with rich yellow.

GALLINACEÆ.

GALLINÆ.—Buhle's *Naturgesch. der domesticirten Thiere*, Heft. 3. (Pfau, Truthuhn und Perlhuhn nebst ihren Verwandten.) Halle, 1842.

This book has not yet reached me.

Delessert, in his *Souv.* p. 26, tab. 10, and Hartlaub, in the *Rev. Zool.* p. 58, have remarked, that *Francolinus nivosus*, Del., is identical with *Fr. Hardwickii*, Gray. Lesson's *Ortyx leucopogon*, is from San-Carlos in Central America. (*Rev. Zool.* p. 175.)

The riddle in Temminck's announcement (*Man. d'Ornitholog.* iv. p. 313), which he put down as very doubtful, that the Turkey (*Meleagris gallopavo*), was found wild in Dalmatia, has been satisfactorily solved, as Küster mentions (*Isis*, p. 611), that *Otis tarda* is known, throughout Dalmatia, by the name of "Wild Turkey." By a similar misunderstanding, Hellenius once took a female of the *Muslon*, which is commonly called a Roe in Sardinia, for *Cervus capreolus*; and thence Rudolphi, from its fruitful pairing with the Ram, drew the conclusion, that the latter fact could not be brought into consideration for the determining of a species. (*Vid. Münch. gel. Anzeig.* iv. p. 936.)

Penelope albiventer, from the province of Nicaragua, has been described by Lesson as a new species. (*Rev. Zool.* p. 174.)

The presence of the genus *Megapodius* in New Holland, has now been proved, by the *M. tumulus* being found on Coburgh Peninsula, on the north coast. (*Gould's Birds of Australia*, part 6.)

The most remarkable thing in these birds, is, their peculiar way of hatching their eggs. These are found in large sand heaps, which are

generally of a conical form; one of them was sixty feet in circumference at the base, and fifteen high: the eggs lay deep in these heaps, slightly covered with sand, which, by the heat of the sun, acquires a considerable warmth. How these heaps have been erected, and how the young come out of them when they have newly chipped the shell, has not yet been observed by Europeans; and only some unsatisfactory accounts have been received from the natives.

Megapodius, *Tallegalla*, and *Leipoa*, form a very remarkable family, from the peculiar manner in which they hatch their eggs. They extend from the Philippines over the islands of the Indian Archipelago, as far as New Holland.

Hartlaub holds it as certain, that the genus *Aleththelia*, Less., is only the young of *Megapodius*. (Rev. Zool. p. 204.)

CRYPTURIDÆ.—Lesson has given a new species from Central America, in the Rev. Zool. p. 210, *Tinamus* (*Nothura*) *cinnamomea*.

CURSORES.

MAYER, in his Neuen Untersuch. aus dem Gebiete der Anat. und Physiol. p. 30, has discussed a peculiar formation of the sexual opening in the female *Emu* of New Holland.

The common opening of the rectum, sexual parts, and urinary organs, has the form of a cup, or crown of a flower, of considerable size. There are twenty-eight folds, or rays, which run from the middle opening of the common fundament, like radii towards the periphery, and form on it so many sacs, or cells, in which a white fatty substance is secreted. The intention of this organ is not known: there is nothing like it in the other running birds. It is remarkable, as the author observes, that even in a bird of New Holland, there is a purse shaped organ in the sexual region, as an expression, so to speak, of the endemic genius of the structure, which, in the same country, prevails in the Mammalia.

A plate is given in the Transactions of the Zoological Society, of a fossil thigh-bone, found in New Zealand, which Owen recognised as that of a bird allied to the Ostrich.

GRALLÆ.

ALECTORIDES.—Gould has now given a drawing of the '*Otis australasiana*, in the Birds of Australia, part 8.

This species is abundant, and spread widely over New Holland. It is larger than the *Otis tarda*. A capital error in Gould's work is the want of measurements, although there is plenty of room.

FULICARIÆ.—*Parra cordifera*, from *Acapulco*, has been described by Lesson in the Rev. Zool. p. 135 and 210. A drawing of *Gallirallus brachypterus*, Lafr., was given in the Magas. de Zool. n. 22.

Leib found the *Fulica americana* brooding, in very great numbers, in the month of June, in the marshes at Lake Erie, in company with the *Gallinula galeata*. The nest is woven of rushes, without lining, 1½ to 2' in diameter, swimming on the water, and attached to the reeds: the eggs, ten to fifteen in number, are oval, greenish-yellow, with small dark brown freckles. (Jour. of Philad. viii. 203.)

ERODII.—Brehm has divided the small German Bitterns (*Ardea minuta*) into three sub-species:—*Botaurus minutus*, *pusillus*, and *melanotus*. (Isis, p. 770.)

HEMIGLOTTIDES.—Drawings have been given of *Platalea regia*, G., and *flavipes*, G., in the Birds of Australia, part 7.

The latter species is remarkable, as it agrees in many respects with the white species of Ibis, and accordingly proves, from another source, the connection of the *Platalea* and *Ibis*, in one family, as asserted by Nitzsch.

LIMICOLÆ.—*Eurhinorhynchus griseus*, Nilss. (*Platalea pygmæa*, Linn.), has been described, with a plate, by Hartlaub, in the Rev. Zool. p. 37.

Cuvier and Temminck have arranged this bird correctly among the Snipes. Its habitat is not Surinam, as asserted by Linnæus, but Bengal.

Nordmann has most exactly shown the difference between his *Glareola melanoptera* (which name Fischer wishes to change into *G. Nordmanni*), and the *G. torquata*. (Bullet. de Mosc. 1842, p. 314. tab. 2.)

They have been very accurately described in the short diagnosis of both species: 1. *Glareola torquata*; "tectricibus inferioribus alarum rufo-castaneis:" 2. *Glareola melanoptera*; "alis supra et subtus unicoloribus nigris." The *Glareola pratincta*, Pall., belongs, as a synonyme to the latter species, which Pallas erroneously esteemed as *G. torquata*. Both species are plentiful in the South of Russia, yet it appears, that the new species is a form found more to the eastward. Whether it also be different from the *G. orientalis*, Nordmann, from want of literary aid, could not decide. But the reporter can assure him, that this alone would not have helped him out, because the description which Leach gives of *G. orientalis* is so inexact, and his plate is so incorrect, that the bird cannot be recognised from it. Since, however, the collection in this place possesses a Javanese specimen, the reporter can add, that *G. orientalis* is quite a different species from the *G. melanoptera*. Certainly the *ulula* is of the same colour; but the wings upon the under side are like the *G. torquata*.

Die Waldschnepfe von C. E. Diezel. Leipz. 1842.

A very excellent little book for sportsmen as well as naturalists, rich in original observations, and distinguished by its lively style.

Of this family, the following species have been represented in the Birds of Australia:—*Charadrius (Lobivanellus) lobatus*, Lath., and *personatus*, G. (part 8); *Rhynchæa australis*, G., and *Recurvirostra rubricollis*, Temm. (part 9).

Hartlaub has given, on tab. 2, in the Rev. Zool., plates of the bill and feet of his *Chionis minor*.

NATATOIRES.

LONGIPENNES.—A large flock of *Sterna arctica* was seen in the interior of England last May, about which a slight discussion has arisen between Strickland and Austin. (Ann. ix. p. 351, 434, 518; x. p. 75). A drawing of *Sterna tereticollis*, Lafr., was given in the Magas. de Zool. n. 27.

TUBINARES.—W. Thompson has cited two cases, in which *Puffinus major*, Fab. was taken in Ireland. (Ann. ix. p. 433.)

UNGUIROSTRES.—The eleventh volume, and first number of the twelfth, of "Naumann's Naturgeschichte der Vögel

Deutschlands," has been published. The concluding half of the former, and commencement of the present volume, are occupied with the genus *Anas*.

The anatomical characteristics of the genus have been arranged, with valuable annotations, by Rud. Wagner, from the papers left by Nitzsch.

The following species have been treated of in the following order:—
First Group, Swimming Ducks, with an unlobed hinder toe.—*a*. Burrowing Ducks, called by later Ornithologists, *Tadorna* or *Vulpanser*, although they have nothing of the Goose tribe. 1. *A. tadorna*: 2. *A. rutila*. *b*. Fresh-water Ducks, "lately divided into five genera and more, on account of slight deviations, which are scarcely tenable, as sub-genera." 3. *A. boschas*: 4. *A. acuta*: 5. *A. strepera*: 6. *A. querquedula*: 7. *A. crecca*: 8. *A. penelope*. *c*. Shovellers. 9. *A. clypeata*.
Second Group, Divers, with the hinder toe lobed. "This great section may be properly divided into several sub-divisions or families, between which there is no want of transitions, on which account it is difficult to determine whether the whole group should be considered as a separate section of the genus *Anas*, or whether our following families of Ducks should appear as so many different genera." *a*. Fen Ducks. 10. *A. rufina*: 11. *A. ferina*: 12. *A. nyroca* (*leucophthalmos*): 13. *A. fuligula*: 14. *A. marila*.

Anas purpureoviridis, Schinz, has been pronounced by Selys and Bonaparte a hybrid of *Anas boschas* and *A. moschata*.

Selys relates, in the *Faune Belge*, p. 141, that he shot a female of *A. purp.* at Longchamps-sur-Geer, in December 1835. He saw a male at Baillon; and examined two other males in the museum at Lausanne, perfectly alike, which had been killed on the Lake of Geneva.

Leib found the nest of *Anas discors*, along with that of *A. boschas*, in the meadows which border on the marshes of Lake Erie. It was composed of dry grass, thickly lined with feathers, and contained eighteen eggs of a delicate cream colour. (*Journ. of Philad.* 1842, p. 204.)

Gould has formed a new genus, *MERGANETTA*, for a species of Duck from the the Chilian Andes. (*Ann.* ix. p. 511.)

In many of its characters, as he says, it approaches the Ducks, but in others it evinces an affinity with the *Mergansera*, especially in its long and stiff tail-feathers and narrow and pointed beak. It differs, however, from either of the groups mentioned, in having, in both sexes, a strong spur on the wing. Gould gives to the species the name *M. armata*.

Gould has figured a new species of Duck in the Birds of Australia, part 6. *Nettapus coromandelianus*, Gm., and *pulchellus*, G.

Yarrell has given a short notice on the Trachea of *Anser gambensis*, in the Ann. ix. p. 147.

Lafresnaye has remarked, in the Rev. Zool. p. 71, that Ducks and Geese, proclaim themselves as different genera by their habits and food—a fact previously known.

PYGOPODES.—*Podiceps antarcticus* of Valparaiso, has been described as a new species by Lesson, in the Rev. Zool. p. 209.

REPTILIA.

BY

DR. F. H. TROSCHER.

SEVERAL Faunas of European countries are here to be mentioned, as interesting with regard to geographical distribution.

A. Zawadzky: Fauna der Galizisch-bukowinischen Wirbelthiere. Stuttgart, 1840.

The section on Reptilia extends from p. 140 to 161. The genera and species are described, and notice taken of their occurrence, habits, and uses; the Polish names are added. This Fauna contains, in all, twenty-five Reptilia, viz., one Tortoise, four Lizards, six Snakes, and fourteen Batrachians, nine species of which are without tails, and five with tails. A list of the Latin names of the genera and species is appended; likewise a list of Polish names, to which the German and Latin ones are added.

H. Freyer: Fauna der in Krain bekannten Säugethiere Vögel, Reptilien, und Fische. Laibach, 1842.

Reptilia from p. 41 to 45. The species are not described, but only the Latin, German, and Krainian names given, with some synonymes, and short remarks on the places where the species are found. Among the twenty-six Reptilia, are two Tortoises, three Lizards, seven Snakes (among which is a new one, *Coluber isabellinus*), and fourteen Batrachians, eight without, and six with tails.

Edm. de Selys Longchamps Faune Belge, 1^{re} partie; Indication Méthodique des Mammifères, Oiseaux, Reptiles, et Poissons, observés jusqu'ici en Belgique. Liège, 1842.

Reptilia, p. 169 to 182. The species are not described, the remarks being confined to notices of their occurrence and varieties. Among the twenty-three species, are one Tortoise, four Lizards, five Snakes, and thirteen Batrachians, eight without, and five with tails. Eight of these twenty-three species are found in almost all parts of the country, twelve in particular localities, and the occurrence of three within the Belgian bounds is not sufficiently determined. There are plates of *Triton palmatus* and *punctatus*, male and female.

In the Fauna Caspio-Caucasia, von Eichwald, Petersburg, 1841,—the section on Reptilia occupies from p. 44 to 128; plates 3 to 31 belong to it.

Three Tortoises are mentioned:—*Ulemmys caspica*, Wagl.; *Emys europæa*, abundant in the rivers which discharge themselves into the Caspian Sea; *Testudo ibera*, Pall.

Many Lizards inhabit the shores of the Caspian. They show, in general, a greater approximation to the Fauna of Egypt and Syria than to that of Europe. *Psammosaurus caspicus*, Eichw.; *Lacerta ocellata*, Daud., *viridis*, Daud., *stirpium*, Daud., *agilis*, L., *strigata*, Eichw. (*L. quinquevittata*, Ménétr., in the Vienna Mus., from Syria, as *L. viridis*, var., *L. Michahellesii*, Fitz.); *Zootoca exigua*, Eichw. (*L. sylvicola*, Eversm.), *crocea*, Wagl., *chalybdea*, Eichw. (*L. saxicola*, Eversm.); *Aspidorhinus* (nov. gen.), *gracilis*, Eichw. (*L. vittata*, Eversm.); *Podarcis velox*, Wagl., *deserti*, Lepechin (*L. variabilis*, Pall.); *Ophiops elegans*, Ménétr. (*Amyates Ehrenbergii*, Wiegman.); *Stellio caucasicus*, Eichw. (*L. stellio et muricatus*, Pall.); *Phrynocephalus caudivolvulus*, Eichw. (*L. caudivolvulus*, Pall.; *Agama ocellata*, Lichtst.), *helioscopus*, Kaup. (*O. helioscopa*, Pall.); *Megalochilus auritus*, Eichw. (*L. aurita*, Pall.); *Trapellus sanguinolentus*, Eichw. (*L. sanguinolenta*, Pall., *Agama aralensis*, Lichtst.); *Gymnodactylus caspius*, Eichw. (*Uromastix fasciatus*, Ménétr.); *Euprepis princeps*, Eichw.; *Pseudopus serpentinus*, Merr.; *Anguis fragilis*, L. (*A. Besseri*, Andr. et Ang. *incertus*, Kryn.)

Snakes.—*Eryx turcicus*, Daud., *Trigonophis iberus*, Eichw. (*Coluber vivax*, Schreiber, *Tarbophis fallax*, Fleischm.); *Trionocephalus halyi*, Licht., *Tomyris* (nov. gen.) *oxiana*, Eichw., new species; *Tropidonotus persa*, Eichw. (*Coluber persa*, Pall.), *natricis*, Kuhl, *ater*, Eichw. (*Tr. natricis*, var. ?); *Scutatus*, Eichw. (*Coluber scutatus*, Pall.), *hydrus*, Fitz., *sauromates*, Eichw. (*O. variegatus*, L., *C. sauromates*, Pall.); *Hemorrhois trahalii*, Boie; *Tyria argonauta*, Eichw., *najadum*, Eichw.

Zachobus lævis, Eichw. (*Col. lævis*, Lacép.); *Zamenis Æsculapii*, Wagl.; *Cœlopeltis Dione*, Eichw. (*Col. Dione*, Pall.), *erythrogastra*, Eichw. (*Col. erythrogaster*, Fisch.), *lacertina*, Wagl., *vermiculata*, Eichw. (*Col. vermiculatus*, Mén.)

The only Batrachians in those regions are, *Hyla viridis*, Laur.; *Rana temporaria*, L., *tigrina*, Eichw. (*Rana dentex*, Kryn.); *cachinnans*, Pall.; *Bufo variabilis*, Pall., *cinereus*, Schneid.

Hence it follows, that the two new genera only contain animals not previously known; but many names bear the authority of the author, although such a change of name was often unnecessary. The *Herpetology* of Dumeril and Bibron is not yet made use of.

Th. Cantor, in an Essay entitled "General Features of Chusan, with Remarks on the Flora and Fauna of that Island," makes some observations on its Reptilia. Ann. ix. p. 275.

Of Chelonian Reptiles, but two forms were found, one of which, *Trionyx tuberculatus*, approaches closely to *T. javanicus*. None of the larger Saurians occur, nor Monitors; but both the little *Hemidactylus*, which is very numerous, and the *Tiliqua* are nearly allied to species inhabiting Bengal and other parts of India. It has generally been believed, that China is infested with very few serpents. At Chusan, although few in species, they are remarkably numerous. *Naja*, which appears to be the only terrestrial venomous serpent, as well as the species of *Lycodon*, *Coluber*, and *Tropidonotus*, are, as pointed out in the descriptions, closely allied to Indian species. *Python Schneideri* has hitherto been found only in Java, Banca, Amboyna, and once at Malacca. All these, however, are forms which characterize tropical Asia. I am told, that several species of Pelagic Serpents occur in the Chusan Archipelago. In the Batrachian Reptiles, there exists a striking resemblance between the Fauna of Chusan and Japan. In both, the Frogs are European forms, the Toads not; *Bufo gargarizans* approaches to the Indian Toad, figured as *B. dubia* in Hardwicke's Illustrations.

The species are furnished each with a short diagnosis (Ibid. p. 482), but as this is limited to colouring, it is insufficient for fixing the species. They are the following;—*Trionyx tuberculatus*, *Emys muticus*; *Hemidactylus nanus*, *Tiliqua rufoguttata*; *Naja atra*, *Lycodon rufozonatus*, *Coluber dhumnades*, *Col. mandarinus*, *Tropidonotus rufodorsatus*, *Python Schneideri*, Merr.; *Rana temporaria*, var., *Rana esculenta*, var.; *Hyla arborea*, var.; *Bufo gargarizans*.

A list of the above mentioned species of Reptiles, collected by Cantor in Chusan, is also to be found in McClelland's Calcutta Journal, vol. ii. 1842, p. 101.

In Ernest Dieffenbach's *Travels in New Zealand*, London, 1843, p. 202, J. E. Gray enumerates the New Zealand Reptilia known to him; their number, however, is but small, being only seven. These are:—Two species of *Tiliqua*, *T. zelandica* and *ornata*; three species of the genus *Naultinus*, of the family of *Geckones*, described by Gray, *Zool. Miscell.*, p. 72, *N. elegans*, Gr., *N. pacificus*, Gr. (*Platydaetylus Duvaucelli*, Dum. Bibr.), *N. punctatus*, Gr., *Hatteria punctata*, Gr., *Pelamys bicolor*. Other Snakes and Amphibia seem to be entirely wanting.

J. E. Gray describes, in his *Zool. Miscell.*, London, 1842, several new genera and species of Australian Reptilia, from a collection made by Gilbert at Port Essington. A description of some Reptilia of other countries, in the British Museum, is also included. (*Ibid.* p. 57.)

Berthold: *Über verschiedene neue oder seltene Amphibienarten*. Göttingen, 1842, 4to.—Unfortunately this has not yet come to hand.

Haro has made known his researches on the breathing of some Amphibia; *Mémoire sur la Respiration des Grenouilles, des Salamandres, et des Tortues*. (*Annales des Sc. Nat.* tom. xviii. p. 36.)

CHELONII.

J. E. GRAY, in the *Zool. Miscell.* London, 1842, describes a new tortoise, *Hydraspis victoriae*, from Victoria River, on the north-east coast of New Holland.

S A U R I I.

SPRING and LACORDAIRE have imparted some information on certain parts of the Organization of the *Phrynosoma Harlanii*, from a specimen brought alive by Pirson from the Texas to Europe.

It was in a state of numbness, from which it could only be roused by the direct influence of the rays of the sun, and by repeated gentle pushes. It opened its eyes, raised its head, and began to run pretty quickly; but soon became again benumbed. Besides the anatomical observations, the authors correct the description of Dumeril and Bibron in regard to

colour. This specimen had, on each side of the back stripe, five black spots, which, on their posterior half, were edged with the finest jonquil yellow; the throat, sides, and roots of the limbs were, as it were, dusted with the same hue; the under half of the body was pure white, without speck. The pores of the thighs could not be discovered. (*Bulletins de l'Acad. de Bruxelles*, ix. 2, p. 192.)

ASPIDORHINUS (nov. gen.), Eichw., l. c. p. 74. Nares prominulæ, exiguis scutellis elevatis apici rostrali impositæ; squamæ temporum subtilissimæ, granulosa; collare; squamæ notæi exiguæ, granulosa. There is one species, *A. gracilis*, Eichw. (*Lac. vittata*, Eversm.)

Tiliqua Essingtonii, Gray, Zool. Miscell., from the north coasts of New Holland.

Lialis Burtoni, *bicatenata*, and *punctulata* are three New Holland species, described by Gray in the work just quoted.

ŒDURA, Gray (nov. gen.), of the family of *Geckonæ*, *ibid.* p. 52. Toes 5-5, wide, free, scaly beneath at root, ends somewhat broader; under side with two rows of cross folds, the last on each toe broad; claws 5-5, concealed in the groove between the folds; back and belly with oval convex equal scales, smaller on the sides; tail oval, lanceolate, very thick, low, with pointed tip, covered with rings of broad scales; anal pores in a crescentic line. *Œ. marmorata*, New Holland.

PYRIA, Gray (nov. gen.), of the family of the *Geckonæ*, *ibid.* p. 53. Like *Ptyodactylus*, but the toes are shorter, thicker, wide at the root, and there are anal pores present. *Ph. punctulata*, New Holland.

Gecko Smithii, from Prince of Wales' Island, and *G. chinensis*, from China, have been described by Gray, Zool. Mis. p. 57.

Tarentula clypeata, Gray, *ibid.*: habitat unknown.

Phelsuma trilineatum and *lineatum* (*Gecko inunguis*, Cuv.), are also described by Gray (*ibid.*): the latter species from Madagascar.

GEHYRA, Gray (nov. gen.), from the family of the *Geckonæ*, *ibid.* p. 57, forms a part of Wiegmann's *Peroplus*, but has the scales of the *Gecko*: it is distinguished from this genus by the length and compression of the end of the toes. *G. oceanica* (*Gecko oceanicus*).

NAULTINUS, Gray, Zool. Mis. p. 72, is distinguished from *Gehyra* by the ends of the toes not being compressed. There are three species: *N. pacificus*, *ib.* p. 58; thumb without nail; bright brown; irregular broad stripe on each side: South Sea Islands. *N. elegans*, *ib.* p. 72; thumb with nail; green; irregular spots on each side of the back: New Zealand. *N. punctatus*, *ib.*, in Dieffenbach, p. 204; thumb with nail; dark green; back with very small black dots; under half yellow-green; 4".

BOLTALIA, Gray, Zool. Mis. p. 58, holds a middle place between *Gehyra* and *Hemidactylus*; toes free, folds beneath numerous, slender, transverse, narrow, divided by a deep small groove; thumb similar; pores of thigh

distinct; tail somewhat compressed, ringed, with a middle row of shields beneath: *B. sublevis*, India.

Hemidactylus depressus, *mercatorius*, and *fasciatus*, Gray, *ibid.*; the first two from Madagascar: of the latter the habitat is unknown.

Goniodactylus Boei, Gray, *ibid.*: from India.

TOLARENTA, Gray (nov. gen.), of the same family; the feet as in *Agama*, but head, nasal fossæ, and eyes, show that the genus belongs to the *Geckones*. *S. Wilkinsonii* (Savigny, Rept. Ægypt. t. c. f. 3): Egypt.

Cyrtodactylus ocellatus, *ibid.* p. 59: from Tobago.

Cyclura quinquecarinata, *id. ibid.* p. 59: Demerara?

The new genus LOPHOGNATHUS, of the family of the *Agama* (Gray's Zool. Mis. p. 53), is distinguished from *Calotes* only by the presence of two or three thigh pores, and two anal pores on each side: *L. Gilberti*, from the north coasts of New Holland.

The genus DIPORIPHORA, Gray, *ibid.* p. 53, of the same family, is distinguished from *Grammatophora* only by two anal pores; in habit it stands between *Grammatophora* and *Calotes*: *D. bilineata*, from the north coast of new Holland.

HATTERIA, Gray, *ibid.* p. 72, of the family of the *Agama*; head four cornered, covered with small scales; throat with a cross fold; nape and back have a ledge of compressed bristles; body covered with small scales; belly and under side of the tail have broad, four-cornered, un-quilled scales, in cross rows; tail compressed, triangular, covered with small scales, and with a crest of broad bristles; toes 5, 5, covered with small scales; no thigh pores; small anal pores: *H. punctata*, from New Zealand.

SERPENTES.

In opposition to the observation of Valenciennes, mentioned in the last report (p. 172), on the temperature in the hatching of the *Python bivittata*, Dumeril is of opinion, that the increased temperature is produced in the eggs of the snake, and is not to be ascribed to the influence of the brooding mother. (Rev. Zool. 1842, p. 5.)

ALOYSII CALORI: De vasis pulmonum ophidiorum secundariis observationes novæ (Commentarii Acad. Bononiensis, v. p. 395), with a lithographic plate.

In the Biblioteca Italiana o sia Giornale di Letteratura, Scienze, ed Arti, compilato da varj letterati (tom. xcix. Milano, 1740, p. 163 and 306), is found a Catalogue Raisonné, describing the Snakes in the Museum of the University at Pavia, by De Filippi. Catalogue ragionato e descrittivo della Racolta de' Serpenti del Musco dell' S. R. Università di Pavia.

Del Dottor Filippo de Filippi, già assistente alla cattedra di storia naturale nella detta Università. The species are arranged according to Schlegel's *Essai sur la Physiognomie des Serpents*; but a new species of the genus *Calamaria* is described (v. i.)

J. E. Gray, in his *Zool. Misc.*, London, 1842, p. 41, gives a synopsis of the family *Boidæ*. This family contains thirty-two species, which the author divides into twenty genera. Of these, eight genera and ten species are found in Tropical America; four genera and five species in Africa; six genera and eight species in Asia; four genera and eight species in New Holland; one species in Europe. The species of the genus *Python* inhabit Asia and Africa, but each division of the world has its separate species. One species of the genus *Eryx* is common to the South of Europe and North of Africa. Several species are cited as new.

There is contained in the same little work, p. 47, a synopsis of the species of the family *Crotalidæ*, which comprises ten genera with thirty species. Six genera and eleven species are peculiar to America; two genera and sixteen species belong to Asia and the islands; one genus is common to Asia and Africa; one genus, with two species, is found in Africa; Europe and Australia contain no species. Several new species are distinguished by their colour.

There is found, besides, in the same work, p. 59, a synopsis of the family *Hydridæ*, which numbers forty-three species in twenty-three genera. Twenty species are found in the Indian Ocean; sixteen in the salt-water canals of India and the neighbouring islands; and six inhabit Tropical America. The following are defined as new genera:—

LAFEMIS; different from *Pelamis*, by the smaller somewhat compressed head, and a smaller mouth: *Hydrus curtus*, Shaw, and *L. Hardwickii*, Gray.

LIOPALA; belly shields broad, the anterior smooth, united, the posterior separated, knobbed; the anterior scales of back smooth; the posterior has a central tubercle; one or two posterior eye shields: *Hydrus gracilis*, Shaw; and *L. fasciata*, Gray.

ATURIA; belly shields tolerably broad, the two middle rows united into a single broad six sided plate; all the scales smooth: *A. ornata*, Gray; *Hydrophis Lindsayii*, Gray; *Hydrus spiralis*, Shaw (*Hydrophis melanura*, Wagl.); *A. elegans*, Gray.

BITIA; tail has two rows of shields beneath; nasal fossæ between two plates; abdominal shields, on each side, quilled; scales smooth: *B. hydroides*, Gray.

DIMADES is American, and contains *Homalopsis plicatilis* and *leopardina*, Schlegel.

FERANIA, like *Hypsirhina*, Wagl., but the body is compressed; the back quilled; tail conical: *Homalopsis Sieboldii*, Schlegel.

RACILITIA; body cylindrical; scales smooth; vertebral shield rather small; anterior shield of forehead small, triangular; a bridle shield; one small anterior, and long posterior eye shield; tail short, conical: *R. indica*, from India.

HIGINA; body cylindrical; scales smooth; abdominal shields rather small; an anterior broad, two posterior smaller eye shields; no bridle shield: *H. fasciata*, from Demerara.

FORDONIA; head broad posteriorly; three forehead shields, the anterior elongated; between the nasal shields no bridle shield; body compressed; tail short: *F. leucobalia* (*Homalopsis leucobalia*, Schlegel).

MIRALIA; Type, *Brachyorros alternans*, Reus (*Homalopsis decussata*, Schlegel).

FARANCIA; anterior forehead shields united into a triangular cross plate; posterior forehead shield broad; nasal fossæ sideways, small, in the midst of a four-sided shield; an anterior and two posterior ocular shields; body fusiform; scales smooth; tail conical: *F. Drummondii*, from California.

Lastly, Gray, in the same work, p. 68, has given a synopsis of the family *Viperidae*. Twenty-one species form the eight genera of this family, of which two genera and three species inhabit Asia; four genera and twelve species, Africa; two genera and four species, Europe; and one genus with one species, Australia; one genus, *Echis*, has both an African and an Indian species.

Gray's genus **DABOIA**, has for type the *Vipera daboia*, Daud; agreeing with it, *D. Russelii*, Russ., Ind. Serp. t. 32; and *D. pulchella* of Ceylon.

Cotuber isabellinus, Freyer, l. c. p. 42; isabella-yellow; eyes red; head has eleven small shields; upper jaw edged with seventeen, under jaw with twenty-one small shields; abdominal shields 221; tail shields eighty-two; length 2' 6"; length of tail 5½"; at Feistenberg in Lower Krain.

Tropidonotus australis, Gray; Zoological Miscellany, p. 54; from the north coast of New Holland.

Calamaria fube de Filippi, l. c. p. 176; head small, not broke off from the trunk; the bridle shield, which is usually wanting in *Calamaria*, is present in this species; back scales bay, with somewhat brighter margin; belly white, with many alternating square spots; both anterior forehead shields white; allied to *Cal. Linnæi*: habitat unknown.

Lycodon reticulatus, and *L. olivaceus*, Gray; Zoological Miscellany, p. 54: both from Australia.

Dendrophis (Ahetulla) fusca and *olivacea*, id. ib.: from same place.

Elaps ornatus, id. ib.; whitish; the scales of back and sides bordered black: Australia.

Naja australis, id. ib.; bright brown, brighter beneath; only two posterior eye shields.

Tomyris, Eichw., l. c. p. 103 (nov. gen.); caput collo subdilatabili latius, duplò longius quam latum, tela 2 utrinque distincta dentesque 2 imperforati breviores, iis postpositi, scutella submaxillaria tria, interque eorum par postremum unum majus (non tria alia minora in triangulo, *Najæ* exemplo); squamæ notæi clongato-lanceolatæ, planæ, læves, exiguæ; gulares majores per 4 series obliquas dispositæ. Affine *Uræo* (*Najæ*), Wagl., genus. There is one species, *T. oriana*; o purpureo rosea, transversim nigro-vittata, vittis integris atris, medio dorso sub angulo confluentibus, postremis evanidis, gulâ e flavo roseâ; $2\frac{1}{2}$ ".

BATRACHIA.

ALOYSII CALORI: Descriptio anatomica Branchiarum maxime internarum gyrini *Ranæ Esculentæ*, unaque præcipuum discrimen, quod inter branchias ad invicem et batrachiorum urodelorum intercedit. (Commentarii Acad. Bonon. v. p. 111); with two lithographic plates.

R. P. Lesson describes a new species of *Bufo*, which he had already briefly characterized in his "Catalogue de la Faune du Departement de la Charente-Inferieure," viz. :—

B. vinearum; first finger as long as second, upper socket margins projecting, rounded, skull covered with thick skin, parotids elliptical, rounded on each side, longish, separated into two parts by a space, skin of tympanum concealed, hinder toes semipalmate; three protuberances on the heel, two on the hands, no lenticular gland on either thigh, no ledge of skin on inner margin of tarsus, iris red, above knobbed, underneath small regular protuberances, no spots. In the vine hills of Haute-Saintonge. (Rev. Zool. 1842, p. 33.)

Some new species of *Batrachia* have also been described by J. E. Gray, in his Zoological Miscellany, viz. :—

Discoglossus ornatus, *Alytes australis*, *Pelodytes nasutus*, *P. affinis*, *Hyla cærulea* (*H. cyanea*, Daud.), *H. rubella*, *Eucnemis bicolor*. They are all from the north coast of New Holland.

Rapp describes three new *Batrachia* in these Archives, 1842, 1, p. 289: *Hyperolius marmoratus*, *Engystoma guttatum*, and *Breviceps verrucosus*.

R E P O R T

ON THE

CONTRIBUTIONS TO THE NATURAL HISTORY OF FISHES,
DURING THE YEAR 1842.

BY

DR. F. H. TROSCHEL.

MACLEAY has made known a new Arrangement of Fishes, in the Calcutta Journal of Natural History for July, 1841, and in the Annals, ix. p. 197, of which the following arrangement of the larger groups may serve as an example :—

I. CTENOBRANCHII; gills pectinated. ●

1. PLAGIOSTOMI, Cuv.—Cartilaginous fish with fixed branchiæ; leading to Mammalia.
2. STURIONES, Cuv.—Cartilaginous fish with free branchiæ.
3. OSTINOPTERYGII, MacLeay.—Bony fish with free branchiæ: leading to Amphibia.

II. ACTENOBRANCHII; gills not pectinated.

4. LOPHOBRANCHII, Cuv.—Bony fish with tufts, arranged in pairs along the branchial arches.
5. CYCLOSTOMI, Cuv.—Cartilaginous fish breathing by a series of cells.

The author calls the first division an aberrant, and the second a normal group. His division, *Ostinopterygii*, he divides again into an aberrant group, *Acanthopterygii* (*Artedi*), all of which he thinks have

Ctenoidian scales; and a normal group, *Malacopterygii* (Artedi), all of which he thinks have Cycloidian scales. The classification then proceeds:—

A. ACANTHOPTERYGII:

1. **BALISTINA.**—*Plectognathi*, Cuv. Maxillary bones soldered to the inter-maxillaries, and both to the palatine arch; opercula and gills concealed under the skin.

- | | |
|----------------------------|----------------------------|
| 1. <i>Balistidae?</i> | 4. <i>Orthagoriscidae?</i> |
| 2. <i>Ostraciontidae?</i> | 5. <i>Diodontidae?</i> |
| 3. <i>Cephalaspis?</i> Ag. | |

2. **PERCINA.**—Bones of the jaws free and complete; operculum distinct; operculum or præoperculum generally with dentated edges, or with spines.

- | | |
|---------------------------|------------------------|
| 1. <i>Chaetodontidae.</i> | 4. <i>Cirrhitidae.</i> |
| 2. <i>Percidae.</i> | 5. <i>Sparidae.</i> |
| 3. <i>Scorpenidae.</i> | |

3. **FISTULARINA.**—Bones of the jaws free and complete; operculum distinct; operculum and præoperculum generally with smooth edges. (We see upon what a small peculiarity this character is founded, when we consider, that even in the same genus, species often occur with dentated and smooth opercula!)

- | | |
|-------------------------|----------------------|
| 1. <i>Scombridae.</i> | 4. <i>Lophiidae.</i> |
| 2. <i>Fistularidae.</i> | 5. <i>Labridae.</i> |
| 3. <i>Gobioidae.</i> | |

B. MALACOPTERYGII:

4. **PLEURONECTINA.**—Ventral fins, when existing, inserted under the pectorals, and directly suspended to the bones of the shoulder.

- | | |
|--------------------------|---------------------------|
| 1. <i>Anguillidae.</i> | 4. <i>Pleuronectidae.</i> |
| 2. <i>Echeneidae.</i> | 5. <i>Gadidae.</i> |
| 3. <i>Cyclopteridae.</i> | |

5. **CLUPEINA.**—*Abdominales*, Cuv. Ventrals suspended behind the pectorals, and not attached to the bones of the shoulders.

- | | |
|-----------------------|-----------------------|
| 1. <i>Siluridae.</i> | 4. <i>Clupeidae.</i> |
| 2. <i>Cyprinidae.</i> | 5. <i>Salmonidae.</i> |
| 3. <i>Esocidae.</i> | |

The number five continues in a similar way to regulate the whole system, three groups always coming together, and then again two.

Several important papers, on the geographical distribution of Fishes, have been already mentioned in this year's report on the Natural History of Reptilia.

A. Zawadzki's *Fauna der Galizisch-bukowinischen Wirbelthiere*, (p. 166 to 182), enumerates forty-four species of Fishes, the number of which might, perhaps, be still farther increased, by continued inquiry. The distance from the sea, says the author, prevents our being rich in Migratory Fish, and yet we can point out many which come into our rivers from the Baltic and the Black Sea. Among the forty-four Fishes, are three species of *Petromyzon*, three of *Acipenser*; six of *Salmo*, one of *Esox*, twenty *Cyprini*, three of *Cobitis*, one *Silurus*, three *Percoidæ*, one *Cottus*, one *Gasterosteus*, one *Gadus*, and one *Muræna*.

H. Freyer in his "*Fauna der in Krain bekannten Wirbelthiere*," has, in all, only thirty-two Fishes, namely, two *Percoidæ*, one *Cottus*, fifteen *Cyprini*, three *Cobitis*, one *Esox*, one *Silurus*, four *Salmones*, one *Gadus*, two *Muræne* (*acutirostris* and *latirostris*, Risso), one *Acipenser*, and one *Petromyzon*.

The *Faune Belge*, 1^{re} Partie, *Indication méthodique des Mammifères, Oiseaux, Reptiles, et Poissons, observés jusqu'ici en Belgique*, par Edm. de Selys Longchamps, Liège, 1842, contains the class of Fishes, from p. 183 to 245.

He divides it into two sections, —Fresh-water Fishes and Sea Fishes. There are fifty-three Fresh-water Fishes in Belgium, forty-three of which live only in fresh-water; six in fresh-water, but which go in winter to the mouths of the rivers; and four live in the sea, but migrate into the rivers in spring or summer. They are divided as follows according to their genera:—One *Acipenser*, one *Pleuronectes*, one *Cottus*, one *Acerina*, one *Perca*, one *Gadus*, thirty-one *Cyprinoidæ*, two *Alose*, four *Salmones*, one *Esox*, two *Gasterostei*, three *Anguillæ*, three *Petromyzones*, one *Ammocetes*. The family of the *Cyprinoids* is treated with peculiar preference, and in a manner that forms a monograph of them. Several new species are described; and figures in lithography are given of *Lenciscus dolabratus*, Holandre, *L. Selysii*, Heckel, *L. jesus*, Jurine, *L. rutiloides*, Selys, *L. rutilus*, *Abramis Heckelii*, Selys, and *Cyprinus striatus*, Holandre. Forty-one species of Sea Fishes are mentioned, thirty of which pass up the Scheldt as far as Antwerp: of the rest none have yet been observed there. These are,—two *Rajæ*, one *Squatina*, one *Spinax*, one *Scyllium*, one *Carcharias*, one *Mustelus*, one *Chimara*, one *Syngnathus*, one *Hippocampus*, five *Pleuronectes*, one *Mullus*, two *Trigle*, one *Cottus*, one *Aspidophorus*, one *Gobius*, one *Cyclopterus*, one *Zoarces*, two *Callionymi*, six *Gadidæ*, three *Clupeacæ*, two *Salmones*, one *Belone*, one *Trachinus*, one *Scomber*, one *Ammodytes*, and one *Muræna*.

The new fishes of the Caspian Sea are figured on four plates, in the *Fauna Caspio-Caucasia*, von E. Eichwald. Petersburg, 1841. They have

all been already described in these Archives, 1838, i. p. 97, to which I refer. The section on Fish contains a copious introduction on fishing, and its extension to the Caspian Sea.

M'Clelland has given some interesting information on the Indian Fishes, collected in different regions by Griffith. (Calcutta Journal, p. 560.) The new Fishes collected in Afghanistan have been described and drawn. They are mentioned below.

Cantor remarks on the Fishes of the island of Chusan, in his treatise previously mentioned, p. 95, that those forms of sea fish which became known to him were almost all also inhabitants of the Bay of Bengal and other parts of the Indian Ocean. The fresh-water fishes are mostly Indian forms. Two species inhabit Bengal, viz., *Anabas scandens*, and *Cyprinus daniconius*, Ham.; one is Javanese, and three are European: among the latter is an Eel, which seems to be identical with *Anguilla latirostris* of Yarrell. (Annals, ix. p. 277.) The species are given at p. 484 of the same work. Many are considered as new. The remark made, when noticing the Reptiles, that the diagnosis is almost wholly confined to colour, is equally applicable here. The fin rays are numbered. The following species are mentioned:—*Anabas scandens*, Cuv.; *Macropodus ocellatus*, *Ophicephalus argus*, *Mugil cephalotus*, Cuv.; *Periophthalmus modestus*, *Eleotris flammans*, *Cyprinus gibeloides*, *Cyprinus auratus*, *Leuciscus daniconius*, Hamilt.; *Cobitis anguillicaudata*, *Hemiramphus intermedius*, *Silurus punctatus*, *Anguilla latirostris*, *Synbranchus grammicus*.

Cantor has also given a list of these species in M'Clelland's Calcutta Journ. vol. ii. 1842, p. 102.

A number of Ph. Fr. de Siebold's Fauna Japonica, Lugduni Bavorum, appeared in the year 1842, which includes Fishes. This work was undertaken by Schlegel. The Fishes which appear in it are all of the family of *Percoide*; many are lithographed, and beautifully coloured; but, upon closer inspection, one is tempted to doubt their correctness. The new species are noticed hereafter.

In the Transactions of the Zool. Soc. of London, vol. iii. part 1, 1842, there appeared a Supplement to a Synopsis of the Fishes of Malacca, by Lowe. The results have already been mentioned, from the Proceedings of the Zoological Society, in a former annual report (Archives, vi. 2), to which I refer.

In the same book is found a treatise by Dr. Richardson on the Fishes of Australia, in which the species are very fully described. This paper has already been mentioned in the Reports for the years 1840-41-42, from the epitome of it in the Proceedings of the Zoological Society. There are three copper-plates, containing the following species:—*Serranus sutor*, *Nemadactylus concinnus*, *Trigla canessa* and *polyommata*, *Lutris hecataia*, *Clinus despicillatus*. Only

one new species, *Scorpena militaris*, appears to have been added to the science.

Dr. Richardson has also published, in the Ann. of Nat. Hist. ix. p. 15, 120, 207, 384, and x. p. 25, contributions to the Ichthyology of Australia, and these are not yet concluded. The materials were furnished by Gould, whose assistant, Gilbert, had collected them at Port Essington, on the north coast of New Holland. Some remarks are added on some drawings of Fishes, made by Lieutenant Emery on the north-west coast of New Holland. There are also some observations on the species from Van Diemen's Land and New Zealand, which are in the Museum at Haarlem. Many species have been described as new, others are looked upon as species already known, and described anew in comparison with the descriptions already given by earlier and by more recent Ichthyologists. The new species are mentioned below.

In Dieffenbach's Travels in New Zealand, Lond. 1843, p. 206, Gray and Richardson have given a list of ninety-two species of new Zealand Fishes now known. Most of them are determined according to older authors, particularly Solander, Banks, and Forster. Some have also been collected by Dieffenbach, and are here described. Long articles are given on *Hemerochetes acanthorhynchus*, Cuv., Val.; *Hemiramphus marginatus*, Lacep., and *Rhombus plebejus*, Soland. Three new species only have been described, viz.—*Eleotris basalis*, Gray, *Galaxias fasciatus*, Gray, and *Anguilla Dieffenbachii*, Gray; but they had already appeared in Gray's Zool. Misc. p. 73. The notice of these Travels has been anticipated, although of 1843, from their close connection with Gray's Miscellany.

Camill. Ranzani has published four treatises on the New Fishes in the Bolognese Museum, in the "Novi Commentarii Acad. Scient. Instituti Bonon;" tom. iv. 1840, p. 65; tom. v. 1842, p. 1, 307, and 339. Peculiar species and genera will be mentioned below. They are all figured.

In the Annali Universali di Medicina di Milano, August, 1841, is contained "Developpement des Poissons: Mémoire lu au Congrès de Florence, par M. de Filippi." (S. Rev. Zool. 1842, p. 45.)

H. J. R. Jacobi de vesica aërea Piscium, cum Appendice de vesica aëra cellulosa Erythrini; Diss. Inaug. Berol. 1842. The author compares the varieties of the swimming-bladder, in all respects, especially as they are given in Cuvier and Valenciennes' Nat. Hist. des Poissons. In an appendix, the swimming-bladder of *Erythrinnus*, which is cellular in the anterior portion of the posterior division, is described, and a drawing of it is added.

ACANTHOPTERYGII.

McClelland describes a small Fish of Calcutta as the *Ambassis lata*, Cuv., in the Calcutta Journal, ii. p. 150.

A. indica, id. ib. p. 585; with a black spot on the top of the anterior dorsal fin; eight upright spines in the dorsal fin, and three at the base of the fin concealed; three upright spines at the base of the anal fin, and one concealed: Loodianah. *A. (Chanda) rconius*, Buchan., has been described by him from the same place.

Apogon lineatus, Schlegel, l. c. p. 3, differs from *A. lineolatus*, Rüpp., by the less breadth of the anal fin, the want of the black spot at the base of the caudal fin, and its less compressed head; D. 7-1. 9; A. 2. 8; C. 17; P. 12; V. 1. 5. *Ap. semilineatus*, id. ib. p. 4, has a black band passing from the point of the nose over the eye till under the second dorsal fin; a second goes from the point of the nose, through the eye, to the point of the operculum; D. 7-1. 10; A. 2. 8; V. 1. 5; P. 13; C. 19. *A. aprion*, Richards., Ann. ix. p. 16; without serratures on the preoperculum, and with a small cluster of teeth on the tongue.

Several species of *Serranus* have been described by Schlegel, l. c. Their Japanese names have been, in general, retained. *S. kawamebari* agrees in form with *S. hepatus*; five cross bands; rows of small spots upon the soft perpendicular fins; a large spot upon the membrane, which fills up the deep semicrescentic section of the operculum; two brown lines on the præoperculum; D. 12. 12; A. 2. 10. *S. latifaciatus*, has two bright very broad bands lengthways, the hinder fins have large dark points; corresponds to *S. merra*; D. 11. 12; A. 3. 8. *S. pæcilonotus*; four white curved stripes lengthways above and on the sides; D. 11. 15; A. 3. 8. *S. octocinctus*; brownish-red, with eight white perpendicular bands; a large black spot on the tail; D. 11. 14; A. 3. 9. *S. tsirimen-ara*; allied to *S. marginalis*, Cuv., Val.; with a row of five or six white spots on the sides; the spinous portion of the dorsal fin only has a black margin; D. 11. 16; A. 3. 8. *S. epistictus*; brownish-red, with three rows of black points on the body; D. 11. 14; A. 3. 8. *S. aka-ara*; reddish-brown, with brick-red spots, becoming on the dorsal fin small oblique bands; D. 11. 16; A. 3. 8; *S. awo-ara*; brown yellow; all the fins, except the spinous portion of the dorsal, have a yellow margin; the body is covered with yellow dots; D. 11. 16, to 11. 18; A. 3. 8. *S. mo-ara*, brown-grey, with some large dark marbled spots; D. 11. 15; A. 3. 8. *S. dermopterus*; uniform brown-red, the fins somewhat darker; D. 11. 19, to 20; A. 3. 9.

Serranus Gilberti, Richardson, Ann. ix. p. 19; the body and the vertical fins covered with umber-brown spots; the ground colour is paler,

and on the back and sides appears like the threads of a net, enclosing the dark round spots. There are about a dozen spots in a row between the gill-opening and caudal fin; P. 17; V. 1. 5; D. 11. 17; A. 3. 9. *S. stellatus*, id. p. 23, resembles *S. Parkinsonii* and *hexagonatus*, Cuv. and Val.; P. 16; D. 11. 15; A. 3. 8. *Serranus luridus*, Ranzani, l. c. v. p. 356; P. 15; D. 11. 15; A. 3. 9; fins brown, bordered with black, body and head yellowish; belongs to the group of *Merous*: habitat the Brazils.

DiaCOPE Sparus, Schlegel, l. c. p. 14; D. 10. 10; A. 3. 8; P. 16; resembles a *Sparus* in habit.

Mesoprion carponotatus, Richardson, Ann. ix., p. 28, back darkish and somewhat clouded; fins unspotted; a dark spot girdles the base of the three upper pectoral rays; D. 10. 15; A. 3. 10; P. 14.

Ranzani also describes two new species of the genus *Mesoprion*, l. c. v. p. 352. *M. bahiensis*, P. 15; D. 10. 14; A. 3. 8; head dark-brown, back red-brown, other parts reddish-silvery coloured. *M. argyreus*, P. 16; D. 10. 12; A. 3. 8; violet spots on the nape, similar lines before the eyes.

Cirrhitcs aureus, Schlegel, l. c. p. 15, uniform golden yellow, the first ray of the soft dorsal fin elongated; D. 10. 12 to 13; A. 3. 6 to 7; $3\frac{1}{2}$ ".

Schlegel, l. c. p. 15, describes a Japanese Fish under the name of *Aulacocephalus*, of the same size with *Centropriustes*. It has three spines on the operculum, the præoperculum is very strongly dentated on the horizontal margin, and the caudal-fin is rounded. The colour is violet, a yellow band runs on each side to the tail and close under the dorsal fin, sinking a little at the anterior end, and goes through the eye to the point of the upper jaw: D. 9. 13; A. 3. 10; P. 12.

Therapon rubricatus, Richardson, Ann. ix. p. 127, with smaller head and larger ventral fins than those of the *Th. servus* and *theraps*; D. 12. 10; A. 3. 9.

Therapon (Pelates) oxyrhynchus, Schlegel, l. c. p. 16; body elongated; snout pointed; palate and vomer without teeth; bluish-green, with four black bands lengthways, between them some indistinct and interrupted ones; D. 12. 10; A. 3. 8.

Schlegel also describes, at the same place, p. 17, a Fish under the name of *Anoptus*, which he places in proximity with *Nandus*. He separates it from *Datnia*, because it possesses vomer teeth; and distinguishes it from *Nandus* by the want of palate teeth. It is olive brown; abdominal and caudal fins blackish; a large black spot anteriorly on the dorsal fin; B. 6; D. 10. 13; A. 3. 8; P. 15. This Fish is figured by Krusenstern, pl. 54, f. 1, a, under the name of *Banjos*.

Percis emeryana, Richardson, Ann. ix. p. 130; the spinous dorsal fin is much arched; D. 5. 21; A. 16.

Sillago burrus, Richardson, Ann. ix. p. 128, is banded on the sides

like *S. maculata*, but wants the silvery lateral stripe, and shows spots on the dorsals; D. 10. 20; A. 1. 21.

McClelland establishes a new Percoid genus allied to *Sillago*, from a very small Fish which Buchanan has figured and described as an *Atherina*. He calls it *Cestreaus*, which name had already been used by Cuvier and Valenciennes. Its characters are, head oval and flat anteriorly; eyes projecting and forward; jaw flat and turned upwards; small conical teeth on the intermaxillary; four gill rays and two rough ledges, those at the upper and posterior angle of the operculum end in blunt points; pectorals round, over the ventrals, the first ray of which is a prickly; dorsals far separate; a fleshy projection from the anal fin. *C. minimus*; D. 5-9; P. 16; V. 1. 5; A. 12; C. 13. (Calcutta Journ. ii. 1842, p. 151.)

Ranzani, l. c. v. p. 340, arranges a new genus, *Diapterus*, in the family of the *Percoida*. The species described, however (*D. auratus*), does not seem to me different from *Gerres brasilianus*, Cuv. and Val.; and must return to that genus.

Scorpaena Inarra, Richardson, Ann. ix. p. 215; crimson fading to reddish-white on the branchiostegous membrane; the side of the head is veined with deeper lines; all the cirrhi are green, and the body is marked with a few irregular olive green blotches. *Sc. panda*, id. ib. p. 216; scales very large, thirty-five in a row, and about sixteen in a vertical line; vermilion with two dark hyacinth-red bands on the side; body spotted with round drops of dark orange-brown; D. 11-10; A. 3-6; P. 16. *Sc. ergastulorum*, id. ib. p. 217; scarlet; a black spot crosses the ninth, tenth, and eleventh dorsal spines; P. 15; D. 12-9; A. 3-5. *Sc. militaris*, id. Transact. Zool. Soc. iii. p. 90; capite breviusculo, cirrhis nullis (?), spinis capitis fere Scorpaenæ porci vel bufonis, operculo summo genisque squamosis, squamis coporis ciliatis; colore carmesino; B. 7; P. 16; D. 12. 10; A. 3. 5; V. 1. 5: Australia.

Synanceia trachynis, Richardson, Ann. ix. p. 385, allied to the *Sc. horrida* and *brachio*, but the posterior dorsal spines are lower than the anterior ones; the præoperculum has a spine; and the species has vomerine teeth. (It belongs, therefore, to the genus *Synalacidium*. J. Müll. Abh. d. Acad. zu Berlin, v. j. 1839.)

Ranzani, l. c. v. p. 342, distinguishes the genus *Hamulon* into two divisions. The first contains the longish, not much compressed species, with complicated lateral lines; the second, those with high compressed body and simple lateral lines. In the second division, two new species have been described, *H. melanopteron*, P. 17; D. 12. 18; A. 3. 9; and *H. moricandi*, P. 17; D. 12. 16; A. 3. 9: both are from Brazil.

Scolopsis longulus, Richardson, Ann. ix. p. 389; four times as long it is high; D. 10-9; A. 3-7; P. 17.

Amphiprion melanogolus, Richardson, Ann. ix. p. 390; three white vertical bands; head and body black; pectoral fin black at the base, the

rest of it primrose-yellow; caudal paler yellow, with an oblique white band; the soft dorsal has a narrow yellow border. *A. (?) rubrocinctus*, id. ib.; black; under jaw, throat, breast, half the tail, and all the fins, vermilion red; the bars are white. *Pagrus quadrituberculatus*, Ranz. l. c. v. p. 348; has four bony protuberances on the head, two on the point of the snout, two before the eyes: Brazil. *Chatodon scorfasciatus*, Richardson, Ann. x. p. 26; has six vertical bands; D. 10-20; A. 3-17; P. 17. *Chelmon marginalis*, Richards., Ann. x. p. 29; wants the two vertical bands which *C. rostratus* possesses; the dorsal fin is rounded, the anal pointed; D. 9-29; A. 3-18; P. 15.

McClelland, l. c. p. 583, describes two new species of the genus *Ophicephalus*: *O. Indicus*, two scales between the eyes, and one on front of snout; head half as long as the body without caudal fin and head; about thirty-six scales along the lateral line; D. 26; P. 17; V. 6; A. 17: Loodianah. *O. montanus*, three scales in a row between the eyes; three scales placed in a triangle in front of snout; about forty-three along the lateral line; pectoral fins with fine transverse bars; D. 32; P. 14; V. 6; A. 17: Himalaya.

Acanthurus vulnerator, Ranzani, l. c. v. p. 350; P. 16; D. 9. 28; A. 2. 26; brown; fins black at tip: Brazil.

Eleotris basalis, Gray, Zool. Misc. p. 73; brown, with fine dark spots; fins blackish; pectorals with a broad yellow band; head blackish; tail round; D. 7-10; V. 5: New Zealand.

Scarus amplus, Ranzani, l. c. p. 324; head and back violet-brown; belly and fins bright red: Brazil.

MALACOPTERYGII.

J. MÜLLER has given important information on some families of the Soft-finned Fishes, with fixed and comprehensive characters for distinguishing them. (Monatsbericht der Acad. zu Berlin, 1842, p. 206.) The reporter has very lately brought the results of these researches together, in an Essay in this year's Archives, to which the reader is referred.

Eq. Antonii Alessandrini: Apparatus branchiarum Heterobranchi anguillaris (Commentarii Acad. Bonon. v. p. 149); with two lithographs.

In a Discourse on the Swimming-bladder of Fishes (Monatsberichte der Acad. zu Berlin, 1842, p. 174 and 202; and

Müller's Archiv. 1842, p. 310), J. Müller, in conjunction with the author of this report, has made known two new genera of the family of *Siluroïdes*, from a MS., "über neue Welse."

CALOPHYSUS, M., T. (l. c. p. 179); wide gill clefts; no teeth in palate; a row of strong teeth on upper and under jaw, behind which, in the one or other, is a row of smaller ones; the first ray of pectoral and dorsal fin simply membered at the end, without spines; a long adipose fin; six barbules; seven branchial rays. The species are, *C. macropterus*, M., T. (*Pimelodus macropterus*, Lichst.); and *C. ctenodus*, M., T. (*Pimelodus ctenodus*, Ag.)

EUANEMUS M., T. (l. c. p. 203); narrow gill clefts; body compressed laterally; crest covered by skin; teeth on upper and under jaw hackle-shaped in a band; none on the vomer and palate bone; the first ray of the dorsal and pectoral fin is a spine; the dorsal stands quite forwards and is small; a very small adipose fin; anal fin very long; rays of the pectorals more numerous than in the other *Siluridae*; eyes concealed by skin; six barbules. The species, *E. colymbetes*, is new, and from Surinam.

Silurus indicus, McClelland, l. c. p. 583; four soft rays on the very small dorsal fin; head short; gill covering posteriorly with a blunt rounded angle; four barbules; B. 11; D. 4; P. 1. 3; V. 8; A. 71; C. 18: Loodianah. Its varieties are, *S. canio*, *duda*, and *chedra* of Buchanan.

Pimelodus pusillus, Ranzani, l. c. v. p. 332 (habitat unknown); seems new. The mail-coat of the head runs out behind to a point, extending to the first ray of the dorsal fin; eight barbules; D. 1. 6; P. 1. 7; A. 10. *P. anisurus*, McClelland, l. c. p. 583; under flap of caudal fin shorter than upper; eight barbules; B. 10 to 15; D. 2. 8; V. 6; A. 9; C. 15: Loodianah. *P. indicus*, id. ib. under flap of caudal fin shorter than upper: eight barbules; B. 2; D. 2. 6; P. 1. 7; V. 6; A. 8; C. 18: Loodianah.

Bagras macronemus, Ranzani, l. c. v. p. 334, appears to be *Galeichthys Gronovii*, Val.; at least it belongs to this genus.

An interesting new genus of *Siluridae* has been described by McClelland, l. c. p. 584, with the name

GLYPTOSTERNON.—Teeth velvety; head broad and flat; mouth at its under surface; eyes small and directed upwards; if there be spines, they are concealed in the membranes of the fins; pectoral and abdominal fins broad, sickle shaped; body beneath more or less covered with warty or striped suction surfaces, in order to attach itself to stones; no bony plates in body: habitat, the mountains of India and Central Asia. *G. reticulatus*; the under surface of the head and the anterior part of the body

forms a flat wrinkled outer surface: found at the source of the Cabul River. *G. sulcatus*; an oval disc on the breast, between the pectorals, composed of cross plates; and a row of similar plates on the broad under surface of the first ray of the abdominal fins; D. 8; P. 13; V. 7; A. 9: Kasyah Mountains. *G. striatus*; eight barbules; a striped suction surface on the breast; B. 8; D. 8; P. 11; V. 6; A. 9: Kasyah Mountains. *G. pectinopterus*; eight barbules; striped on the breast; B. 9; D. 8; P. 9; V. 6; A. 7: Simla Mountains. *G. labiatus*; lips enveloped with many flaps, and so broadened round the mouth, that they form a broad flat sucking disc; anal fin very small; dorsal without spines; adipose fin long; barbules very short; D. 7; P. 14; V. 7; A. 6: Mishnee Mountains. From the formation of the lips, should this species not form a peculiar genus?

McClelland describes another new genus of the same family, which he calls OLYRA. Its characters are:—

Body soft, long, and cylindrical, with two dorsal fins, the first radiated, the second adipose; head elongated, and flat at the snout; the gill covering ends posteriorly in an oblique point turned towards the dorsal fin; anal long, caudal entire; teeth velvety; no dorsal spine; six to eight thin barbules. *O. longicaudatus*; a rough spine before the pectoral fins; jaws equal in length; six bristly barbules; the middle ray of the caudal fin elongated into a point; B. 6; D. 7; P. 1. 6; V. 5; A. 23. The author observes, in this species, a union between the Shad-fish and Cobites. *O. laticeps*; under jaw longer than the upper; head anteriorly very low; eyes small and vertical; the rays of the anal fin increase in length posteriorly; six or (?) eight thin barbules; B. 13; D. 7; P. 9; V. 7; A. 15: Kasyah Mountains.

Callichthys personatus, Ranzani, l. c. v. 1842, p. 322, appears to be *C. longifilis*, Val.

Hypostomus brevitentaculatus, Ranzani, l. c. v. 328, is *H. duodecimalis*, Val., Hist. Nat. xv. p. 498.

The sixteenth volume of the great Histoire Naturelle des Poissons, par Cuvier et Valenciennes, appeared in 1842, and contains the commencement of the family of the Cyprinoids, viz., the genera *Cyprinus*, *Barbus*, *Labeobarbus*, Rüpp.; *Schizothorax*, Heckel; *Orcinus*, McClelland; *Dangila*, Val., *Rohita*, Val., *Capeta*, Val.; *Cirrhinus*, Cuv., *Gobio*, Cuv., *Tinca*, Cuv., *Labeo*, Cuv. In an appendix, the author condemns the divisions of the Cyprinoids made by Hamilton, Buchanan, and John McClelland, and tries to reduce them to the genera above mentioned. He then gives the species with barbules, which he thinks doubtful; their number is considerable.

Dangila, Val., has a long dorsal fin, without an anterior spine; a

border of conical papillæ on the thin upper lip, and four barbules: the species are from Java and India.

Nuria, Val., has a short dorsal fin directed backwards, without an anterior spine; two barbules at each side of the corner of mouth; lips thin; species from Ceylon and Indir.

Rohita, Val.; lips fleshy, more or less fringed; a thick fold of skin forms superiorly a sort of stumpy fleshy snout, and beneath there is a velum, which conceals the opening of the mouth in the closed state; in the open state, the mouth forms a sort of sucking-cup. To this belong several of Buchanan's species.

Cupota, Val.: only two barbules at the corners of the mouth; the first ray at the dorsal fin hard and serrated, or hard and not serrated, or soft.

McClelland, l. c. p. 576. has arranged a number of new species, and also a new genus, in the family of the *Cyprinoids*.

RACOMA is distinguished from *Schizothorax*, Heck., by protrusile jaws, the intermaxillary forming a moveable border. *R. gobioides*; the operculum ends in a round point; dorsal fin central; between the eyes and caudal fin it has anteriorly a prickly ray, which posteriorly is serrated; D. 3. 8; P. 19; V. 1. 11; A. 6: Bamcan River; 12". *R. chrysochlora*, brownish-yellow; D. 3. 8; P. 19; V. 10; A. 8: Lolpore, Cabul River; 10". *R. nobilis*; body and fins have many small spots; D. 3. 9; P. 19; V. 11; A. 8; 18". *R. labiatus*; head longer than the height of the body; intermaxillary covered with thick fat; the barbules end in three points; D. 3. 8; P. 19; V. 10; A. 7: Pushut, Koonar River, at Jallalabad. *R. brevis*; lips covered with a thick fleshy membrane; fins small; D. 2. 7; P. 20; V. 11; A. 7: Helmund River.

SCHIZOTHORAX, Heck.; head elongated and conical; snout pointed; intermaxillary fixed. *a.* Under lip, only at the corner of the mouth, has a free enveloping margin. *S. intermedius*; D. 4. 8; P. 1. 18; V. 1. 10; A. 2. 6: Cabul River, at Jallalabad; Tarnuck River. *b.* The enveloping margin to the under lip, free at the point. *S. edeniana*; border of the under lip entire; snout compressed; dorsal spine serrated at the base; D. 3. 8; P. 1. 19; V. 1. 9; A. 1. 7: Cabul River, at Koti-i-Ashruf. *S. ritschieana*; posterior margin of the under lip triple flapped; lips broad; dorsal spine broad; body spotted; D. 4. 8; P. 1. 19; V. 1. 9; A. 1. 6: Affgharistan. *S. barbatus*; head elongated; lips thin and hard at margins; dorsal spine very broad, compressed, and bony; D. 3. 8; P. 20; V. 12; A. 2. 6: Cabul River, at Jallalabad.

Orcinus plagiosomus (*Schizothorax plagiosomus*, Heck.), *O. Griffithii*; mouth half as broad as the length of the head; dorsal spine broad; D. 4. 8; P. 20; V. 11; A. 1. 6: Affghanistan.

Cirrhinus burnesiana; head short, thick, and round; gill covering narrow and small; under jaw short; mouth beneath; D. 9; P. 16; V. 9; A. 7: Cabul River at Jallalabad.

Opsarius piscatorius; back arched before the dorsal fin, anal fin under the posterior part of the dorsal; mouth small; sides silvery, with nine bars; D. 8; P. 16; V. 9; A. 8: Scharanpore. *O. bicirratus*; two cirrhi; length of the head equal to height of body; dorsal fins somewhat before the anal; thirty-five scales on the lateral line, and nine incomplete stripes on the sides; D. 8; P. 13; V. 8; A. 2. 10: Khyber Pass and Cabul River at Jallalabad.

Leuciscus neglectus, Selys' Faune Belge, is distinguished from *L. idus*, L., by its longer head, lower body, deeper cleft caudal fin; the lateral lines consisting of fifty-five scales, while in the *idus* sixty are present: found at Brussels. *L. rutiloides*, id. ib.; D. 12; A. 13; length 5" 9"; fins yellow: perhaps only a variety of *L. rutilus*.

Aspius alburnoides, id. ib.; D. 11; A. 19-21; fifty scales on the side line, eight rows above, four beneath: nearly allied to *A. alburnus*.

Abramis Heckelii, id. ib.; D. 13; A. 19-20; lateral line has forty-eight to fifty-three scales, ten rows above it, five below: *A. Buggenhagii* (?), Yarrell; 8" 10".

Cobitis bontonensis, McClelland, l. c. p. 586; snout somewhat compressed; lips fringed; six barbules; D. 8; P. 11; V. 8; A. 6; C. 18: Boutan at the Mishmee Mountains.

Platycaura anisura, id. ib.; caudal fin entire, sickle-shaped posteriorly, as the under rays are shorter than the upper; five rudimentary barbules in front of the mouth, two at the corners; D. 10; P. 21; V. 11; A. 7; C. 19. *P. dissorhynchus* has a disc behind the mouth; snout smooth and round; caudal fin four-cornered; D. 9; P. 18; V. 9; A. 6; C. 19: both species are from the Kasyah Mountains.

J. Müller has arranged, in his family of the *Characinae*, a new genus, *HEMIODUS*.

A row of teeth on the intermaxillary like round leaflets, serrated at the margin; no teeth in the under jaw; adipose fin. The species, *H. crenidens*, from Brazil, is *Salmo unimaculatus*, Bloch. (Monatsberichte der Acad. zu Berlin, 1842, p. 106, and Müller's Archiv. 1842, p. 324.)

J. Müller separates the genus *Erythrinus*, as it is defined by Agassiz, into two sub-genera.

The one, *Erythrinus*, Cuv., Müll., has simple hackle-formed palate teeth; the larger dog teeth, under the jaw teeth, are proportionably short; the swimming-bladder cellular. *E. utitaraniatus*, Ag. (*Synodus*

erythrinus, Bl. S.), and *E. salvus*, Ag. The other, *Macrodon*, Müll., has a row of larger conical palate teeth before the hackle-formed ones; under the jaw teeth several very large dog teeth; swimming-bladder without cells. *M. trahira*, Müll. (*Er. macrodon*, Ag., *Synodus malabaricus*, Bl. S.), and *M. brasiliensis*, Müll. (*Er. brasiliensis*, Ag.) (Monatsberichte der Acad. zu Berlin, 1842, p. 173; Müller's Archiv. 1842, p. 308.)

McClelland, l. c., makes known an Indian *Salmo*, *S. orientalis*.

A row of hooked teeth along the margin of the under jaw; the intermaxillary is continued along the margin of the upper jaw, by which structure there are two rows of teeth in it; some teeth on the vomer and on each side; three at the point of the tongue; head equal to height of body, and a fourth of its whole length; back and sides have green and red irregular spots; B. 12; D. 12; P. 14; V. 10; A. 10: Rivers near the Oxus.

Selys Longchamps confirms the presence of *Coregonus oxyrhynchus* on the Belgian coast; he found ten individuals among *Osmerus eperlanus* in the market at Brussels; they came from Antwerp. (Bullet. de l'Acad. de Bruxelles, ix. 2. p. 510.)

Chupea macrophthalmia, Ranz. l. c. v. p. 320; eyes large; small conical teeth in both jaws; no side lines; Br. 8; D. 17; A. 17: Brazil.

Exocetus bahiensis, Ranzani, l. c. v. p. 362; abdominal fins pretty large, reaching as far as the fourth ray of the anal, nearer the anal fin than the operculum, which is without scales; no appendices to the jaws.

Esox indica, McClelland, l. c. p. 582; commencement of dorsal fin exactly above that of anal; D. 12; P. 11; V. 7; A. 15; C. 15: Loodianah.

Hemiramphus unifasciatus, Ranz. l. c. p. 326: Brazil. *Belone raphidoma*, Ranzani, l. c. v. p. 359: Brazil.

Stannius has published, in Müller's Archiv. 1842, p. 338, a Treatise on the Peripheristic Nervous System of the Haddock (*Gadus Callarius*).

Ranzani, l. c. iv. p. 76, describes a *Synbranchus fuliginosus* from Brazil, which, if not identical with, is certainly very nearly allied to *S. marmoratus*, Bl.

The teeth stand, in front, in six, at the sides, in three rows; lateral lines not branchy; the dorsal fin begins behind the anal; the tail measures only $\frac{1}{4}$ of the whole length; but with this statement the drawing does not agree.

Ranzani, l. c. iv. p. 76, describes a *Gymnothorax funebris*, which closely resembles the *G. afer*, Bl., but is unspotted, and comes from Brazil.

Conger opisthophthalmus, Ranzani, l. c. iv. p. 78; eyes almost behind the corner of the mouth; lateral lines channelled with angular inverted margins. *C. brasiliensis*, id. ib. p. 79, pl. xiii. f. 1; anteriorly four conical teeth, laterally teeth in five rows; lateral lines consist, as it were, of a row of scars in the skin. *C. cylindroideus*, id. ib. p. 80; teeth in two rows; on each side in front of the snout two tubes, the anterior of which has a thread-formed appendix: all three are from Brazil. *C. rubescens*, id. ib. p. 81, from the Mediterranean, has the teeth in four rows.

EUCHELIOPHIS, J. Müller (Monatsbericht der Acad. zu Berlin, 1842, p. 205); no pectoral fins; the gill clefts on both sides united in the middle by the junction of the gill membranes; the anus is placed much farther forward than in the *Ophidion*, and immediately behind the gills; rays of the gill membrane six. The species, *E. vermicularis*, Müll., is new; 4"; the body prolonged posteriorly to a point.

G. Valentin has published an Essay on the Anatomy of the Electric Eel (*Gymnotus electricus*), in the new Denkschrift der allg. Schweizerischen Gesellsch. für die gesammten Naturwissenschaften Bd. iv. Neuchat. 1842.

LOPHOBRANCHII.

A. DE QUATREFAGES gives, in the "Annales des Sciences Naturelles," tome xviii. p. 193, a Contribution to the History of the Development of the *Syngnathus ophidion*, Linn.

The author thinks the observation new, that the eggs in this species are fixed free under the body. This fact had been already made use of by Fries as a ground of division of the genus (v. Archiv. 1838, i. p. 238). Only one step in the development has been described, as the author had only the eggs of one Fish for examination.

PLECTOGNATHI.

RANZANI, l. c. iv. p. 72, describes two new species of *Tetradon*, from Brazil.

The one, *T. marmoratus*, has two tentacula, and behind them the nasal fossae. It is rough on the back, smooth on the sides; beneath it

has points, in which small sharp spines are concealed; superiorly it is marbled with brown and grey-brown; on the sides it has a row of black spots; there is no mention of a cuticular bulb on the sides. The other, *T. pachycephalus*, has in a hollow papilla two nasal fossæ; the belly is rough with prickles, which stand, as it were, in the meshes of a net; superiorly it is dark grey; on the sides silvery.

CYCLOSTOMI.

THE Treatise mentioned in last year's Jahresbericht, p. 186, on the Anatomy of *Amphioxus lanceolatus*, by John Goodsir, has appeared, accompanied with two lithographic plates, in the Transactions of the Royal Society of Edinburgh, vol. xv. part 1, p. 247.

PLAGIOSTOMI.

A. ALESSANDRI has written "Observationes super intima Branchiarum Structura Piscium cartilagineorum." (Comment. Acad. Bonon. iv. 1840, p. 329.)

The two Dog Fishes described by Ranzani, from Brazil, have been, at a later date, also described by Müller and Henle. His *Galeus maculatus*, l. c. iv. p. 69, is *Galeocерdo tigrinus*, Müll. and Henle. His *Carcharias porosus*, l. c. iv. p. 70, is probably *Carcharias (Prionodon) Milberti*, Val.

REPORT
ON THE
CONTRIBUTIONS TO THE NATURAL HISTORY OF THE
MOLLUSCA, DURING THE YEAR 1842.

BY
DR. F. H. TROSCHEL

D'ORBIGNY has invented an instrument of general interest, for measuring the spiral angles of the convoluted shells of the Mollusca. He calls it a Helicometer.

It consists of two arms, moveable by a joint, and to the one a semi-circle, divided into 180 degrees, is attached. If a shell is laid between the two arms, the spiral angles can be immediately found out. D'Orbigny remarks, that Shells can thus be brought into three divisions:—1. They have a spiral angle regular in its whole length: 2. The spiral angle is convex, or swollen in the middle: 3. It is concave. He points out the different ways of measurement applicable to these three forms. The increase of the spire is more or less rapid, and the oblique direction of the suture agrees with it. It is enough that a shell be placed in the Helicometer, with the mouth undermost, so that the one arm lies parallel to the axis or side of the spiral angle, whilst the other follows the suture. This measurement D'Orbigny calls the suture angle. He measures, besides, the length of the last whorl in relation to the whole length of the shell. (Institut. 1842, p. 52.) Unfortunately, the difficulty of exact measurement, and the irregularity of the spire in the same species of shell, will be an impediment to the introduction of this instrument into science.

Under the title, "Abbildungen und Beschreibungen neuer oder wenig-gekannter Conchylien," R. A. Philippi has commenced a new work at Cassel, the first number of which has appeared. Cassel, 1840.

It contains six plates, upon each of which, species of one genus only are represented. The plates are also numbered according to the genera, so that, at the conclusion of a volume, or of the whole work, they can be arranged systematically. The aim of the work is to represent, in good plates, new or little known Shells,—which aim it seems likely to accomplish, as the more recent plates of the second number for 1843, which has already appeared, are progressively improving. Those of the first number contain the genera *Melania*, *Strombus*, *Helix*, *Natica*, and *Unio*.

G. B. Sowerby's *Thesaurus Conchyliorum*, or Figures and Descriptions of Shells, Part 1, London, 1842 (the other parts I am not acquainted with), contains Monographs of *Helicinus*, *Pupina*, *Rostellaria*, *Aporrhais*, *Struthiolaria*, and *Strombus*.

There are figures of all the species with each number, and the larger ones on a scale smaller than nature, so that each plate is full in figures. The descriptions are short, consisting merely of the specific character. The work is absolutely necessary for the naming of collections.

Two sheets of text, which conclude the first volume, have been received of the *Histoire Naturelle de l'Ile de Cuba*, par Ramon de la Sagra, in which D'Orbigny has written the Mollusca. They contain the genera *Pyramidella*, *Tornatella*, *Siphonaria*, *Vermetus*, *Odontostoma*, *Helicina*, and *Cyclostoma*. The first seven sheets of the second volume have already appeared. The work is making rapid progress.

Numbers seventy-three to eighty-two, of Kiener's *Species Général et Iconographie des Coquilles Vivantes* have appeared in the year 1842, and contain the text for the genera *Cerithium*, *Ranella*, and *Tritonium*, and plates of the *Tritonium* and *Murex*.

Of Lovell Reeve's *Conchologia Systematica*, or complete System of Conchology, the first two parts of which have

already been mentioned in the previous report, twelve numbers have now appeared, which conclude the work.

There are 300 neat copper-plates in all, with 1500 figures. The book contains, with a few exceptions, most of the genera hitherto described. It is particularly to be recommended in the study of the Mollusca, from the fidelity of the drawings; although it cannot be concealed, that the arrangement and view of the genera do not always correspond to the present standard of science. It would be too long to cite here all the misconceptions of this sort; but the arrangement of *Littorina*, *Scalaria*, *Turritella*, and others in the family of *Turbinaceæ*; of *Natica* in that of the *Neritaceæ*; of *Ampullaria* in *Peristomata* (*Paludina* and *Valvata*), &c., may serve as examples. In illustration of the false limits of genera, the connection of *Physa*, *Limnæus*, and *Amphipeplea*, in one genus, may be adduced. Here and there, too, a species falsely defined is met with; for certainly the shell figured as *Ampullaria rugosa*, Lam. (*Nerita urceus*, Müll.), is not that species, but rather *A. globosa*, Swains. The first five numbers form the first volume, and contain the *Cirripeda* and *Bivalves*. The remaining seven contain the rest of the Mollusca, and form the second volume. Ehrenberg's *Polythalamia* (*Foraminifera* of D'Orbigny) are joined to the *Cephalopoda*; but only five genera are figured as types of the different forms. Several new species are incorporated in the work, which is particularly important on this account, as they have already been defined in the Proceedings of the Zoological Society.

One number, the fifth of the second volume, of the long interrupted *Iconographie der Land und Süsswasser Mollusken*, von Rossmässler, has appeared in 1842.

The first plate contains species of the genus *Helix*; the second of *Clausilia*; the third of *Pupa*; the fourth and fifth of *Anodonta* and *Unio*. Many species are new. In the preface, the author promises that the twelfth number shall conclude the second volume; and then there will appear a "Fauna Molluscorum Extramarinorum Europæ," in which he will arrange, systematically, the collected materials. We hope he may soon make good his promise.

During the year 1842, two numbers, the fifth and sixth, have been added to Hartmann's *Erd und Süsswasser Gastropoden*.

In the fifth number, species of the genera *Helix*, *Neritina*, and *Limnæus*, with varieties and monstrosities, are figured. The author also adds exotic genera, viz., *Helix* (*Chromocochlea*), *Turbinoides*, and

Mindorana, and promises to do so oftener, which gives, in fact, a new feature to the work. The plates of the sixth number comprise the genera *Pupa*, *Planorbis*, *Clausilia*, *Helix*, with their varieties and monstrosities. Of exotics there are *Helix pulcherrima*, *hemastoma*, and some species from the Canary Islands and Madeira.

An Index Molluscorum Grœnlandiæ, by Möller has appeared. (Naturhistorisk Tidskrift. Utgivet af Henrik Kröver, 1842, iv. p. 76.) The work has also been published in a separate form, under the same title, Hafniæ, 1842. The detailed analysis will be given below. Many species are new.

Cantor remarks, on the Fauna of Chusan, that the Fresh-water Mollusca are rich in forms: some approach to European species, three are identical with Indian, viz.,—*Helix tapeina*, Benson, *Planorbis compressus*, Hutton, and *Helix naninodes*, which last is also found at Singapore. (Ann. ix. p. 277.) The species, among which there are three new genera, have been described by Benson. (Ibid. p. 486.)

In the Bulletin de l'Academie de Bruxelles, vol. ix. 2, p. 340, are to be found diagnoses of some new species of living and fossil shells by Cantraine, which belong to the basin of the Mediterranean. The living species are mentioned in a future part of this report.

Many remarks, on the presence of Mollusca, are to be found in the Reports of Journeys in Dalmatia and Monte Negro, by Küster. (Isis, 1842, p. 283, 609, 743, and 847.)

Petit corrects, in the Rev. Zool. 1842, p. 232, the synonymes of several Shells, which had been described by R. P. Lesson in the same journal. Lesson's *Fusus funiculatus* is = *F. Dupetitthouarsii*, Kiener; *Fusus Rosa-ponti* is *Turbinella multinoda*, Auct. Lesson cites the *Mitra casta*, *M. bicolor*, *Oliva tuelcana*, and *Ol. puelchana* of D'Orbigny, as belonging to one species of *Mitra*. This the author denies from his own inspection of the specimens.

George Hyndman gives a list of thirty-nine species of Mollusca, which he obtained, with the dredging net, about two miles east of Sana Island, at the depth of forty fathoms. (Ann. x. p. 19.)

W. Thompson has added a list of Mollusca (ibid. p. 21), found also with the dredging net, at a great depth on the Scottish coasts. From fifty fathoms, eight miles S. S. W. of the Mull of Galloway, he obtained five living species and three dead; from 110 to 140 fathoms, five miles S. W. of the Mull of Galloway, one living species and six dead; from 145 fathoms in Beaufort's Dyke, about five miles S. W. from the Mull of Galloway, eight living species and ten dead.

D'Orbigny has presented to the Société Philomatique, some eggs of the *Voluta brasiliensis*. They have a diameter of seventy millim., while the animal itself has only 200; they are oval, and have a cartilaginous, pliant, and transparent shell. Each egg contains fifteen or twenty

yellowish yolks, surrounded by a thin membrane. At a later period an embryo is formed in the middle of each yolk, which, on farther development, verges to the side of the shell, when having reached the size of ten millim., and with two convolutions, the foetus breaks through and escapes. (Institut. 1842, p. 43.)

Some remarks are added, at the same place, by Laurent, on the egg capsules of the *Valvata piscinalis*. These capsules are globular, affixed to some body under water, and contain ten to twenty eggs, surrounded by a common glaire. Each has its separate shell, ending in a twisted thread at each pole, and only one yolk. When the development of the eggs is far advanced, the capsule is torn asunder, and the eggs come out: some days later the covering of the individual egg opens and lets the embryo escape.

Laurent mentions, in the same place, that seminal animalcules are found in the egg of the *Limax agrestis*. He says also, that the grape-formed organ in the Hermaphrodite Snails, which contains, in its parenchyma, seminal animalcules and eggs, is provided with a single outlet, to convey the egg and the seminal animalcular fluid into the first chamber of the matrix; while, at the same time, the secreting organ of the glaire supplies the necessary proportion of jelly. The matrix only supplies that portion which forms the egg-shell; and this gradually thickens the nearer the egg is to its exit. The author possesses a preparation of a *Limax ater*, which died during the formation of the egg.

CEPHALOPODA.

MILNE EDWARDS has given, in the *Annales des Sciences Naturelles*, xviii. p. 331, a full account of the *Spermatophora* of the *Cephalopoda*, in continuation of his observations made with Peters in Nizza, and already mentioned in the former year's Report. Four plates belong to this treatise, the last of which exhibits the male organs of generation of the *Sepia officinalis*.

A. Krohn has given some additional remarks on the Structure of the Eye of the *Cephalopoda*, in the *Leopoldiner Acten*. xix. 11, p. 41.

R. Ball exhibited to the Irish Academy the following *Cephalopoda*, as a contribution to the Fauna of the Irish Sea. (*Ann. Nat. Hist.* ix. p. 348):—

Sepia officinalis; *S. rupellaria* (?); *Loligo sagittata*, var. (?); *L. subulata*, two varieties (?); *L. media*, and a variety (?); *L. Eblanæ*; *Eledone ventricosa*; *Octopus vulgaris*; *Sepiola Rondeletii*; *Rossia Owenii* and *R. Jacobii*; *Spirula australis*. He considers the two *Rossia* to be new. *R. Owenii* has large acetabula placed on long pedicles in three rows, those of the centre row being not more than half the diameter of those on each side; on the first pair of arms the acetabula are more numerous, more equal in size, and smaller than on the others. *R. Jacobii* has smaller acetabula, and arms proportionably shorter.

Peters has given, in Müller's Archives, 1842, p. 329, some contributions to the anatomy of the *Sepiola*; they refer to the ink-organ and parts of generation. The author esteems, as of doubtful value, the differences between the species of this genus hitherto described, since the smaller breadth of the cuticular flap which unites the mantle and head, as well as the presence of an under eyelid, can furnish no specific character, for the former varies very much, and an under eyelid is present in all the *Sepiolæ*.

Owen has received from Captain Belcher a specimen of *Nautilus pompilius*, with the shell, from Amboyna. The position of the animal in the shell agrees exactly with the description which Owen had formerly given of it in his Memoir on the Pearly Nautilus. The spire of the shell is covered by the dorsal fold of the mantle, and is lodged in the concavity at the back of the muscular plate above the head. The infundibulum rests upon the outer wall of the large chamber containing the animal. (Proc. Zool. Soc. 1842, p. 143.)

PTEROPODA.

CANTRAIÑE mentions, in the Bulletins de Bruxelles, ix. 2, p. 340, that *Odontostoma rugulosum* is *Dentalium trachea*, Montagu, and calls it, accordingly, *Odontostoma trachea*.

Odontostoma lævissimum, id. ib.; testa cylindrica, arcuata, vitrea, lævissima, inferne oblique truncata, subpapillosa, clausa: Golf von Cagliari.

Möller, l. c. p. 4, gives a new *Limacina*; *L. balea*, testa turrita, anfr. 7; spira prominente, apice acuto.

HETEROPODA.

MILNE EDWARDS has now published his Observations, made along with Peters, on the Organization of the *Curinaria*

mediterranea, in a more extended state than formerly. (Annal. des Sc. Nat. xviii. p. 323; vide Archiv. 1841, ii. p. 265.)

Lovell Reeve has given a plate and description of a new species of *Carinaria*, viz. :—

C. gracilis; shell transparent, compressed at the sides; keel with a simple straight edge; vertex small; length $3\frac{5}{8}$ " ; breadth, $1\frac{1}{8}$ " ; height 2" : habitat unknown. (Annals, ix. p. 140.)

GASTEROPODA.

PULMONATA.

DESCRIPTION des Limacides de l'Amerique, par Amos Binney. Boston, 1842.

This work, unfortunately, has not yet come to hand. The author describes all the species of *Limacidae* which are found in North America, with Latin diagnoses and English descriptions, accompanied with remarks on their geographical distribution and habits. The species are—*Limax flavus*, *agrestis*, *campestris*, new species; *Arion hortensis*; *Tebenophorus* (new genus) *carolinensis* (*Limax carolinensis*, Auct.); *Philomycus* (Rafin.) *dorsalis*, Binn. (S. Rev. Zool. 1842, p. 221.)

W. H. Benson has arranged a new genus, *Incilaria*, in the family of the *Limacidae*, which only differs from *Limax* in this, that the body is bordered by a velum. The species, *I. bilineata*, is livid, with two lateral and one mesial stripe, and the velum is sprinkled with brown points and spots. (Ann. ix. p. 486.)

The *Vitrina sigaretina*, Recluz, from the banks of the Cazamanca, in Africa, described in the Rev. Zool. 1841, is to be found figured in the Magas. de Zool. 1842, pl. 59.

Vitrina zebra, Le Guillou; t. rotundata, umbilicata, supra depresso-convexa, subtus convexiore, hyalina, flammulis albis et spadiceis oblique undulatis ornata; anfractibus 4 supra tenuiter striatis; apertura subdilatata, umbilico minimo; 7 mill.: Auckland Island. (Rev. Zool. 1842, p. 136.)

Pfeiffer describes (Proc. Zool. Soc. 1842, p. 187) three new species of *Succinea*, *S. elegans*, *reflexa*, and *variegata*, from Chili; and remarks, that they belong to the same group with *Helix gallina-sultana*, Chemn., in which, according to Pfeiffer, are also to be reckoned *Bulimus Broderipii* and *coquimbensis*, for, on account of the want of a columella, these are probably true *Succineæ*. D'Orbigny's observations prove that the animal of the *S. gallina-sultana* is very similar to *Succinea* in its form and habits.

Lea, in the Proceed. of the Amer. Philosoph. Soc. 1841, p. 31, gives the diagnoses of nine *Succineæ*: *S. gracilis*, from Java; *wardiana*, from Ohio; *totteniana*, from Newport; *nuttalliana*, from Oregon; *aurea*, from Ohio; *candeana*, from Martinique, which is perhaps *S. haliotidea*, Mitre (Rev. Zool. 1841, p. 65); *fulgens*, from Cuba, perhaps *S. sagra*, D'Orbigny; *oregonensis*, from Oregon; and *inflata*, from South Carolina.

In the Rev. Zool. 1842, p. 1, is to be found an "Essai d'un Arrangement de plusieurs Mollusques du genre *Helix*, selon les lois de leurs variations spécifiques, par Ch. Porro."

The author regards the following as varieties of one species:—*Helix carseolana*, Fér.; *circumornata*, Fér.; *companyoni*, Anton; *erycina*, Jan.; *globularis*, Ziegl.; *grohmanniana*, Phil.; *gualteriana*, Fér.; *hispanica*, Partsch (non. Lam.); *hospitans*, Bonelli; *marmorata*, Fér.; *melitensis*, Fér.; *muralis*, Müll.; *nebrodensis*, *mandralisca*, *niciensis*, Fér.; *paciniana*, Phil.; *Raspailli*, Payr.; *segestana*, Phil.; *serpentina*, Fér.; *signata*, Fér.; *splendens*, Drap.

Mitre describes three new species of the genus *Helix* in the Annal. des Sc. Nat. xviii. p. 188:—*H. minoricensis*; testa orbiculato-convexa, imperforata, glabriuscula, albida aut lutescente, superne maculis fuscis interruptis, inferne aliis fasciam fingentibus; anfractibus 5 convexiusculis, spira prominula, apice fusco; labro margine reflexo; fauce pallide rosea, columella subdentata; 7''' : Minorca. *H. telonensis*; testa subdepressa aut convexiuscula, cornea tenui, pellucida, subtilissime striata; anfractibus 5 convexis, ultimo majore, apertura rotundata, peristomate acuto, simplici, umbilico magno; 4''' : Toulon. *H. Nyeli*; testa orbiculari, carinata, supernè depressa subtus convexa late umbilicata, subtilissime striata, grisea vel lutescente, supra maculis fuscis, infra duobus fasciis ornata; apertura angulata, labro albo, tenui, intus marginato, subreflexo; 5''' : Minorca.

Souleyet has characterized three new species of the same genus in the Rev. Zool. 1842, p. 101:—*H. Chevalierii*; circular, deeply umbilicated; keel slight, brown, with a chestnut band; 37 mill.: Malacca. *H. Daron-deauii*; circular, with a keel; olive brown, obliquely wrinkled, striped crossways; 41 mill.: Luçon. *H. touranensis*; conical, umbilicated, thin, closely striped, bright brown; 16 mill.: Cochín-China. These three species have been figured in the "Zoologie du Voyage de la Bonite."

Le Guillou has increased the number of the species of the genus *Helix* by twenty-six, for the diagnoses of which we refer to the Rev. Zool. 1842, p. 137. Their names are as follows:—*H. umbilicata*, Sumatra; *subgranosa*, N. Australia; *Nouletii*, Viti Islands; *recluziana*, habitat unknown; *Jannellii*, N. Australia; *salomonis*, Salomon Islands; *deles-*

sertiana, Warrior Island (Straits of Torres); *tritonensis*, New Guinea; *succinulata*, Guaham; *ternatana*, Ternate; *crouanii*, Hamao; *albula*, Ternate; *Valenciennesii*, habitat unknown; *approximata*, Hogoleu and Ternate, *arrowensis*, Arrow Islands; *hyalina*, Salomon Islands; *concentrica*, Vavao; *aucklandica*, Auckland Islands; *oceanica*, Tahiti; *Blainvillii*, Arrow Islands; *torticollis*, New Guinea; *Kiesneri*, New Guinea; *purpureostoma*, New Guinea; *quadrifasciata*, Ternate; *gut-tata*, Ceram; *cyclostomata*, Warrior Islands.

Helix Guerini, Pfeiffer (Rev. Zool. 1842, p. 304); is somewhat more depressed than *H. trochiformis*, Fér.; brown, wrinkled lengthways; at the keel of the last whorl, and at the base of the others, closely fringed with hairs: Plateau of the Nilgherries.

Helix zeus, Jonas, ib.; umbilicated, circular, with oblique wrinkles and elevated spiral streaks; the last whorl angled; superiorly brown, with yellow zigzag lines; inferiorly has a broad brown band: Philip-pines.

Pfeiffer (Proc. Zool. Soc. 1842, p. 85) describes sixteen species of *Helix*, which were collected by Cuming on the Philippines, and have been named by Sowerby, Broderip, and himself. And at p. 150 of the same volume, he gives descriptions of six additional species from the same islands.

Helix Valtoni, Lovell Reeve (Proc. Zool. Soc. 1842, p. 49); ovate, depressed; dark ruddy-brown with streaks lengthways; aperture with a black lip: Ceylon. It is figured in the Conch. Syst., and is especially characterized by its curiously speckled epidermis.

Helix ravidula, Benson (Ann. ix. p. 486), sub-globular, umbilicated, with six whorls, somewhat plaited transversely: Chusan.

H. naninoides, id. ib.; shell sub-discoidal, slightly striated in a radiating manner above, and marked below with distant smooth striae: habitat Singapore; scarce at Chusan.

In the first number of Philippi's descriptions and plates of new shells, the fourth plate is devoted to the genus *Helix*. Most of the species have been described by v. d. Busch, and are already contained in Pfeiffer's Symbolæ, No. 2, viz.,—*H. Rumphii*, *gemina*, *bataviana*, *inquinata*, *rotatoria*: all from Java. *Bensoni*, from Bengal. The *H. fibula*, Sow., is also figured; and *H. conus*, Phil.; shell conical; keel sharp; chestnut-brown, with yellow sutures: Java.

Helix tennesseensis, Lea (Proc. Amer. Phil. Soc. 1841, p. 31); above plano-convex; convex beneath; yellow, obliquely striped; umbilicated; labrum inwardly concealed: Cumberland Mountains. *H. mobiliana*, id. ib. p. 82; globular; reddish-horn colour, shining; umbilicated; aperture lunated, labrum reflexed: Mobile, Alab. *H. minutissima*, id. ib.; globular; brownish horn coloured; umbilicated; four whorls; aperture roundish; labium sharp: Cincinnati.

Petit de la Saussaye distinguishes, as a species of *Helix* distinct from the (*Streptaxis*) *comboides*, D'Orb., of Chiquitos, a shell from Bahia, mentioned by Moricand, in the writings of the Geneva Nat. Hist. Soc.; and he calls it *H. (Streptaxis) dejecta*. It has two teeth on the labrum, while in the *H. comboides*, D'Orb., only one, of a much larger size, is found. The author also gives here the character of a new species, *Helix Candeï*; testa subovali, albida, nitida, perforata, anfr. 5-6, convexiusculis; apertura rotundata, edentula, breve reflexa, umbilico parvulo; 5 mill.: New Granada. (Rev. Zool. 1842, p. 175.)

Carocolla cumberlandiana, Lea (Proc. Amer. Phil. Soc. 1840, p. 289); whitish, marked with brown; widely umbilicated; aperture furrowed interiorly: Cumberland Mountains. *C. edgariana* (id. ib. 1841, p. 31): above plain, beneath convex; bay; not umbilicated; columella has one tooth: Cumberland Mountains.

J. C. Jay of New York describes two new species of *Bulimus* (Rev. Zool. 1842, p. 80). *B. malleatus*; testa ovato-oblonga, sub-ventricosa, subtenui, rugoso-malleata, albida, maculis fuscis subseriatis irregulariter picta, anfractibus quinis, ultimo maximo, spira conico-subacuta, apice obtuso, apertura ovato-acuta, intus sublutescente, columella contorta, labro albo, crassiusculo, late reflexo, umbilico ovato-oblongo; long. 55 mill.; larg. 28 mill. *B. fulguratus*; testa oblonga, solidiuscula, transversim striato-undulata, anfractibus quinis, convexiusculis, ultimo dilute olivaceo, flammis fuscis fulgurantibus interdum confluentibus ornata, superne maculis albis alternis cineto, spira conico-subacuta, decorticata, dilute-rosea, apertura ovato-oblonga, intus subfulva vel aurantia, columella plicata, umbilico oblongo, labro reflexo, albido; long. 50 mill.; larg. 22 mill.: both species are from an island in the Pacific.

A new *Bulimus*, described by Souleyet, is to be found in the same work, p. 102. *B. umbilicaris*; testa umbilicata, ovato-conica, albido-rosea, lævigata, anfr. 6-7 convexiusculis, apertura ovato-oblonga, angustata, columella subrecta, reflexiuscula, labro tenui, subreflexo, umbilico magno, cylindrico, usque ad apicem perspicuo; 13 mill.: Bolivia.

Dr. J. H. Jonas (Proc. Zool. Soc. 1842, p. 188) describes four new *Bulimi*. *B. calobaptus*, umbilicated; reddish, with yellow wavy bands. *B. balanoides*, yellow, with brown red bands; base of the last whorl green. *B. aplomorphus*, yellow, with three red brown bands. *B. simplex*, green, the last whorl has an obtuse angle.* All from the Philippines.

Pfeiffer describes (Proc. Zool. Soc. 1842, p. 88) five species of

* This seems a proper place to remark, that the reporter, in his abridgement of the specific characters, here and elsewhere, often omits those particulars which are most distinctive. —TRANS.

Bulinus from the Philippines, collected by Cuming, viz., *B. breviculus*, *Cumingii*, *lignarius*, *juglans*, and *nympha*. And nine species of the same genus are described by him at p. 151, viz., *B. cochliodes*, *cuyoensis*, *effusus*, *macrostoma*, *romblonensis*, *solidus*, *subcarinatus*, *uber*, and *virens*.

Pfeiffer also describes four species of *Bulinus*, from Chili (ibid. p. 186), viz., *B. Bridgesii*; yellow-brown: *pachychilus*; strong; white: *rhodacme*; umbilicated; white with reddish spots and flashes: *terebralis*; wrinkled lengthways; whitish; above brownish-blue.

Bulinus smaragdinus of Reeve is green, with a white band at the sutures. (Proc. Zool. Soc. 1842, p. 49.) It is from the Philippines, and was first figured in the Conch. Systematica. *Bulinus jayanus*, Lea (Proc. Amer. Phil. Soc. 1841, p. 31), oval conical; above whitish, beneath chestnut-brown; umbilicated; six whorls: Java.

Partula Dumartroyi, Souleyet (Rev. Zool. 1842, p. 102), testa ovato-conica, pallide olivacea, superne fusca, anfr. 6, sub-convexis, lævigatis, apertura obovata, bilamellata; lamella palatali validiore, immersa, lamella columellari brevior; labro intus incrassato albido aut fusco, extus tenue compresso, basi subreflexo; umbilico mediocri; 10 mll.: Sandwich Islands. *P. inflata*, Reeve; testa obeso-conica, transversim tenuissime striata, albida, epidermide luteo-fusca induta; anfractu ultimo angulato-inflato, umbilicato; apertura subquadrata, labro planissime expanso. (Proc. Zool. 1842, p. 197.)

Achatina Perroteti, Pfeiffer (Rev. Zool. 1842, p. 305), approximates to several species of the genus *Glandina*; smooth, transparent; the last whorl measures a third of the whole length: Plateau of the Nilgherries.

Lovell Reeve has described four new species of *Achatina* (Proceed. Zool. Soc. 1842, p. 55); which have been figured in his Conchologia Systematica, vol. ii. *A. lactea*; cream-coloured, striated longitudinally: Zanzibar. *A. tinctoria*; whitish, stained with large longitudinal spots; apex rose coloured: Africa (?). *A. Kransii*; chestnut brown, marked with small zigzag stripes except on the last whorl: Cape Natal, Africa. *A. picta*; bright yellow, with green bands crossing the whorls; aperture round, yellowish: Cuba.

Achatina erecta, Benson (Annal. ix. p. 487), whitish, fusiform, rough; eight whorls: Macao.

A. turbinata, Lea (Proc. Amer. Phil. Soc. 1841, p. 31), whitish; obliquely banded and spotted; sub-carinated. *A. striata*, id. ib., cylindrical; striped longitudinally; horny; eight whorls: both are from Siberia.

J. Forster has published an Essay in the Acten der Leopoldiner Academie, vol. xix. pars 2, p. 249, "Ideen über die Gebilde der Clausilien," in which he separates, and describes fully, the different forms of the *Clausilia ventricosa*, not as species, but as "*Gebilde*" (forms), to which

he gives separate names. There are three forms, and the first is divided into three orders.

Clausilia pluviatilis, Benson (Annal. ix. p. 486), pale olive colour; fourteen whorls, all faintly striated transversely; at the base of the lip an oblique solid fold, and a parallel groove. *Cl. aculus*, id. ib., brownish; ten or eleven whorls, marked with faint oblique striæ; aperture with two or three teeth: both are from Chusan.

Pupa Hoppii, Müller (Grœnl. p. 4); testa detrorsa, cylindracea, obtusa, lævi; columella bidentata.

The *Cyclostoma euvierianum* and *Melanostoma Petit*, formerly described in the Rev. Zool. 1841, have been figured in the Magas. de Zool. 1842, pl. 55, 56.

Cyclostoma Gironnieri, Souleyet (Rev. Zool. 1842, p. 101); orbicular; umbilicated; white with brown spots; chestnut brown beneath; 22 mill.: Luçon. *C. maculosu*, id. ib.; bulged and spherical; umbilicated, with a keel, with yellow and brown lines and spots; 14 mill.: Luçon.

D'Orbigny has described several species of *Cyclostoma* in the Hist. Nat. de Cuba. *C. latilabris*, allied to *C. labeo*, but shorter; conical and longitudinally striped. *C. ventricosa*; bellied out; pupa-formed; smooth; rose-coloured; anteriorly violet. *C. auriculata*; cylindrical; longitudinally striped; umbilicated; whitish; anteriorly violet. *C. bilabiata*; whitish; rose coloured, with lamellated striæ crossways; aperture with two borders. *C. pudica*; violet, striated crossways; margin of aperture, above the umbilicus, divided into two flaps. *C. Pretrei*; white; umbilicated; lamellated longitudinally; spinous across. *C. auberiana*; finely striated crossways; suture deeply crenated; labrum simple. *C. candeana*; furrowed across; lamella-like striæ longitudinal; suture irregularly lamella-like crenated; labrum bipartite. *C. delatreana*; not umbilicated; yellow with brown bands; ribbed lengthways; striated across; suture crenated; aperture oval. *C. sagra*; umbilicated; yellow, spotted brownish-red longitudinally and across; cross striæ; suture simple; aperture oval. *C. poeyana*; deeply striated across; brownish-yellow with red bands; suture simple; aperture oval.

Several new species of *Cyclostoma*, from the Philippines, are to be found described by G. B. Sowerby in the Proc. Zool. Soc. 1842, p. 80. *C. acuti-marginatum*, *luzonicum*, *canaliferum*, *validum*, *Stainforthii*, *tuba*, *philippinarum*, *altum*, *pupiniforme*. *Cyclostoma cincinnatensis* of Lea (Proc. Amer. Phil. Soc. 1840, p. 289), has this character;—t. elevato-conica, lævi, nitida, diaphana, umbilicata, anfractibus senis; apice obtuso, labro margine reflexo: Cincinnati.

D'Orbigny characterizes a new genus, *Odontostoma* (the name has been already given), in the family of *Cyclostoma* (Ramon de la Sagra's Hist. Nat. de Cuba, Mollusques, p. 237). It is distinguished from *Helicina*

only by the margin of the mouth not being thickened, and by the presence of teeth on the columella, which are continued inwardly like lamellæ. The animal seems to want an operculum. The two species are from Cuba. *O. depressa* is low and has six whorls: *O. globulosa* is spherical, with five whorls: both have two lamellæ on the columella.

Helicina sagraiana, D'Orb., Cuv., is distinguished from *H. major*, Gray, by the thickened unreflexed margin of the mouth. *H. variegata*, *marmorata*, and *lunieriana*, appear to correspond with varieties of Pfeiffer's species *H. adspersa*. *H. crassa*; thick; spherical; streaked lengthways; bay with white band; the angle of columella toothed. *H. zephirina*; spherico-conical; smooth; reddish; labrum white. *H. petitiana*; conical; yellow; furrowed across; labrum white; angle of columella sharp. *H. Sloanii* is *H. conica*, Pfr. *H. conica*; trochiform; yellow; smooth; aperture triangular; whorls keeled; angle of columella plain, sub-dentated. *H. trochulina*; trochi-form; smooth; angle of columella convex; aperture semicircular. *H. elegans* appears to be *H. rupestris*, Pfr. *H. elongata*; elongato-conical; smooth; above as it were hammered obliquely; bright yellow. *H. rotunda*; spherical; smooth; rose coloured; angle of columella emarginated. *H. dentigera*; roundish; depressed; smooth; white with a band; angle of columella dentated, emarginated. *H. minima*; roundish; depressed; smooth; bright rose colour; less than the preceding. *H. globulosa*; spherical; smooth; white with broad bands: all these are from Cuba.

Sowerby enumerates more than seventy species in his monograph on the genus *Helicina*, l. c., amongst which several are new. *H. jamaicensis*; *H. aurantie*, Gray, sinuillima, sed t. magis conica et magis tenui; peritremate pallidior, minus incrassato. *H. Brownii*, t. globosa, tenui, anfr. ultimo magno; apertura semilunari, labio externo reflexo, paululum expanso, prope columellam incisura elongata; labio interno prope columellam subcalloso; columella obliqua, acuta. *H. lutea*, t. globosa, subangulata, lævi; labio externo paululum expanso, vix incrassato, labio interno leviter incrassato: Antilles. *H. antillarum*, t. depressa, magna, tenui, leviter striata, anfractu ultimo magno, labio interno tenui, prope columellam paululum incrassato, columella rotundata, angusta, obtusissime angulata; labio externo expanso, reflexo, postice subdepresso: Antilles. *H. guadeloupensis* (Zool. Proc. 1842, p. 7). *H. maculata*, t. trapezoides, subangulata supra infraque conica, lævi, tenui, rubrofasciata et maculata, labio externo reflexo, subexpanso, ad basin columellæ tenui, columella subcallosa, ad basin attenuata, operculo corneo: South America. *H. polita* (Zool. Proc. 1842). *H. similis* (Zool. Proc. 1842). *H. parva* (Zool. Proc. 1842). *H. maxima* (Zool. Proc. 1842). *H. pellucida*; *H. zephyrina*, Ducl.; similis, sed columella pæne recta, subangulata: Guiana. *H. pyramidalis* (*H. conica*, D'Orb.) *H. angustissima* (*H. acutissima*) (Zool. Proc. 1842). *H. trochiformis*, ib. *H. aglutinans*, ib. *H.*

Lazarus, ib. *H. rotella*, t. lævi, angulata, vix carinata, labio externo reflexo, labio interno expanso, columella subangulata. *H. pilosa* (Zool. Proc. 1842). *H. angulata*, ib. *H. cornea*, *H. orbiculata* (*Oligyre orb.*, Say), simillima sed t. crassiori, labio externo ad basin columellæ subemarginato, columella callosa. *H. minutata* (Zool. Proc. 1842).

The species from the Proc. Zool. Soc. are also published in the Annals, x. p. 400.

Sowerby's monograph of the genus *Pupina*, l. c., contains nine species. The text is already printed in the Proceed. Zool. Soc. 1841, p. 102. Vide Archiv. 1842, ii. p. 390.

R. B. Hinds describes two new species of *Pupina*. *P. aurea*; golden yellow; aperture with a notch below, emarginated above and toothed: New Guinea. *P. mitis*; brown; a red line on the sutures; aperture with a notch inferiorly; above emarginated and toothed: New Ireland. (Ann. x. p. 83.)

Auricula frumentum, Petit de la Saussaye (Rev. Zool. 1842, p. 105); brown; columella with three folds; no umbilicus; 8 mill.: Peru. *A. avena*, id. ib.; brown; cylindrical, pointed; columella has three bright violet folds; labrum inwardly thickened in the middle; no umbilicus; 7 mill.: Chili.

Petit de la Saussaye describes (Proc. Zool. Soc. 1842, p. 201), six species of the genus *Auricula* as new, which were collected by Cuming. *A. tornatelliformis*, from the Philippines; *doliolum*, from Luçon; *reclusiana*, from West Columbia; *pyriformis*, ib.; *ceylonica*, from Ceylon; *pulchella*, from the Philippines.

Carychium exile, Lea (Sillim. Amer. Journ. 1842, p. 109); very high; whitish, striated longitudinally; six whorls; three teeth in the aperture: Philadelphia.

Lovell Reeve has published (Ann. Nat. Hist. ix. p. 218; and x. p. 74) a synopsis of the genus *Scarabus*, in which he comprehends eleven species. They are all figured on a plate, which also belongs to the author's Conchologia Systematica. *Helix clausa*, Wagn., which is included, evidently does not belong to this genus. The *Auricula scarabeus*, Quoy, he names *Sc. striatus*. There are, besides, two new species described: *Sc. lekithostoma*, which is distinguished by the bright yelk-yellow colour of the mouth: and *Sc. pyramidatus*, the most oblong of the species, with a mouth yellowish and highly enamelled.

R. B. Hinds describes a new species of the same genus from the Feejee Islands: *Sc. pollex*; chestnut brown; strongly striated longitudinally. (Ann. x. p. 82.)

Lea describes some species of the genus *Physa* in the Proc. Amer. Phil. Soc. 1841, p. 32. *Ph. hildrethiana*, from Illinois; *inflata*, from Virginia; *troostensis*, from Nashville.

Benson notices the presence of *Planorbis spirorbis*, Müll., and *Lymnaeus glaber*, Müll., in Ireland. (Calcutta Journal, vol. ij. p. 223.)

Planorbis papyraceus, Benson (Ann. ix. p. 487); very minutely radiato-striated; keeled at the margin; hollowed on both sides. *Pl. hemisphaerula*, id. ib.; superiorly convex, beneath hollowed; without keel: these are from Chusan. *Pl. regularis*, Lea, Proc. Amer. 1841, p. 32; spherical; plain superiorly, beneath narrow umbilicated; transparent; pale yellow; three whorls keeled superiorly: United States.

Pl. buchanensis, id. ib.; lenticular; keeled at circumference; beneath narrow umbilicated; three whorls: Ohio. *Pl. bellus*, id. ib.; orbicular; beneath wide umbilicated; greenish-yellow; four whorls, keeled above, sub-keeled beneath; interiorly reddish-brown: Tennessee.

Lymnaea plicatula, Benson (Ann. ix. p. 487); last whorl transversely with plait; the suture impressed; spire pointed, generally ferruginous. *L. minor*, id. ib.; smooth; four whorls; fold of collumella obsolete: both are from Chusan.

Lea describes sixteen species of this genus in the Proc. Amer. Phil. Soc. 1841, p. 32, viz., *L. philadelphia*, from Philadelphia; *griffithiana*, from Lake Charlotte, New York; *nuttalliana* and *bulimoides*, from Oregon; *exigua*, from Tennessee; *planulata*, White Sulphur Springs, Va.; *fusiformis*, Niagara; *rustica*, Ohio; *plica*, Tennessee; *coarctata*, Newport; *casta*, *parva*, *curta*, *striyosa*, *kirtlandiana*, from Ohio; *rubella* from Oahu.

CTENOBRANCHIA.

NEW GENERA AND SPECIES.

Valvata bicarinata, Lea, Proc. 1841, p. 83; t. orbiculari, superne planulata, bicarinata, subcrassa, superne cornea, inferne albida, late umbilicata, suturis impressis, spira depressa, anfractibus quaternis convexis, apertura rotunda, intus albida: Schuylkill River.

Paludina Breughelii, Cantraine, Bull. de Brux. ix. 2, p. 349; testa ovato-conoidea, solida, corneo-fulvescente, epidermide viridi-fusco; anfr. 4-5 convexis; apertura ovali, superne vix angulata, spiram non æquante, peristomate continuo, labro simplici: Malta.

Paludina subfusca, id. ib.; testa conoidea-depressa, subperforata, corneo-viridescente aut fulva sub-epidermide fusca; anfr. 3-4 convexis; apertura ovato-rotundata, superne vix angulata, spiram superante; labro acuto simplici; labio reflexiusculo, subincrassato, peristomate continuo: Istria and Dalmatia.

Paludina quadrata, Benson, Ann. ix. p. 487; olive green, with slight transverse plaits; furrowed longitudinally. *P. lecythoides*; with

transverse faint folds; 6-7 whorls; margin of mouth somewhat turned back, black. *P. (Bithynia) longicornis*; four whorls; polished; margin of mouth somewhat turned back, blackish. *P. (Bithynia) striatula*; polished; horny; margin of mouth turned back, blackish, wavy; these are all from Chusan.

Paludina seminalis, Hinds, Ann. x. p. 83; obtusely turreted; apex eroded; mouth bluish: California. (Allied to *P. nuclea* of Lea.)—*P. regularis*, Lea, Proc. Amer. Soc. 1841, p. 34; spherical; greenish horn coloured; not umbilicated; five whorls; mouth large, interiorly blue: Ohio (?). *P. obtusa*, id. ib.; cylindrical; greenish; slightly umbilicated; four whorls: Ohio. *P. troostiana*, id. ib.; bellied out conically; horn-yellow; umbilicated; mouth large, round: Tennessee. *P. angulata*, *coosaensis* and *cyclostomaformis*, id. ib. p. 83, from the Coosa River, Alabama. *P. incrassata* and *coarctata*, id. ib. 1843, p. 243, from Alabama. *P. bermondiana*, D'Orbigny, Cub.; greenish; umbilicated; anteriorly slightly keeled.

D'Orbigny describes, in the Hist. de Cuba, several species of his genus *Paludestrina*; viz., *P. auberiana*, *affinis*, *candeana*.

Lea describes, in the volume already quoted, p. 34, five species of the genus *Anculosa*,—*troostiana*, *gibbosa*, *dentata*, *carinata*, *variabilis*; and at p. 83, *A. rubiginosa*, *bella*, *griffithiana*, *tuberculata*; and, 1842, p. 243, *A. incisa*, *Foremani*, *solida*, *flummatu*; as also *Amnicola orbiculata* and *parva*.

Io tenebrosa, Lea, ib.; testa fusiformi, subtenui, subnigra, lævi, spira conica, suturis vix impressis, anfractibus senis, subplanulatis, apertura irregulariter pyriformi, intus purpurea: Tennessee.

LAGUNCULA, nov. gen. Benson, Ann. ix. p. 488, testa turbinata, subglobosa, apertura majori, integra, oblonga; peristomate interrupto; labio subreflexo; umbilico profundo, tortuoso. There is one species, *L. pulchella*, from Chusan.

Haldeman makes some remarks on the genera allied to *Melania*. *Pirena aurita* he is inclined, on account of its fringed mantle, to place with the *Cerithinae* (genus *Claviger*, Hald. ib. vol. xlii. p. 216). *Pirena atra* he considers as the type of the genus, and puts it in the family of the *Melaniæ*, as he says it has the same connection with *Melanopsis*, as *Melania* has with *Anculosa*, in respect to organization and habits. (Sillim. Amer. Journ. vol. xli. p. 21.)

The genus *Melania* is remarkably rich in newly described species. Two species, *M. cancellata* and *M. (Hemisinus) (?) Swains.* *crebricostis*, from Chusan, are described by Benson. (Ann. ix. p. 488.) In the first number of Philippi's plates and descriptions of new Shells, the first plate is dedicated to the genus *Melania*; and the new species are defined by v. d. Busch. *M. Winteri*; turreted; greenish; near the suture a row of pointed protuberances; basis striped: Java. *M. flammulata*;

fusiform; reddish-brown, with rust brown flames longitudinally; eleven whorls: Java. *M. coronata*; bellied; decollated; a row of pointed protuberances near the suture; three whorls: Bengal. *M. semigranosa*: longish; decollated at the point; four whorls; two granulated lines near the suture; base smooth, with black lines: Java. *M. crassa*; bellied; decollated; olive coloured; glittering; $2\frac{1}{2}$ whorls: Bengal. *M. glans*; longish; smooth; decollated; two whorls; mouth bluish: Java. *M. zonata*; oval; smooth; eroded at the point; yellow brown, with three black bands: Bengal. *M. testudinaria*; smooth; decollated at the point; yellowish with black streaks; four whorls: Java. *M. torquata*; turreted; smooth; yellow brown; $4\frac{1}{2}$ strong convex whorls: Java. *M. terebra*; fusiform; greenish-grey, with points and black longitudinal lines: Java. *M. ornata*; longish; smooth; olive green; four whorls; adorned superiorly with brown spots: Java. *M. granum*; small; bay; latticed; eroded at the points: Java. Besides these there are figured also, *M. tuberculata*, Müll. (*Melanoides fasciolata*, Oliv.), and *M. spinulosa*, Lam.

Lea describes many *Melanie* in the different annual Proceedings of the Amer. Phil. Society. Two species, *M. catenoides* and *boykiniana*, from Chatahooche River, l. c. 1840, p. 289. In the volume for 1841, p. 11, he divides the genus into nine groups, viz., smooth, plaited, keeled, furrowed, striped, knotty, granulated, latticed and spinous. Of new species there are described, twenty-five smooth, sixteen plaited, five keeled, one furrowed, three striped, three knotty, one granulated, and two latticed. To name all these would require too much space, and for the same reason we omit the seven additional species described at p. 82, and the twelve others shortly described in the volume for 1842, p. 242. Lea's catalogue extends in all to 266 species of the genus *Melania*, of which forty-four are fossil.

Melania brevis, D'Orb., thick; smooth; brown with black lines; four whorls. *M. cubaniana*, id.; black brown; smooth; oblong. *M. conica*; oblong conical; smooth; brown green; last whorl somewhat keeled.

Benson, Ann. ix. p. 488, forms a new genus, *BATILLARIA*, with *Cerithium zonale*. Testa turrita, insculpta, rudi; anfractibus plurimis; apertura oblonga, infra angustiore, basi truncata, evasa; labro sinuato, supra emarginato, infra protracto, labio supra callo munito; columella planata, basi incrassata, oblique truncata, canalem vix efformante; operculo corneo tenui, spirali, multiverticillato. There is only one species, *B. zonalis*.

MENESTHO, nov. gen., Möller, l. c., animal pede elongato, angusto; ore simplice, membrana linguali destituto (?); tentaculis brevioribus, crassiusculis, oculos perparvos ad basin internam ferentibus; operculo paucospirato, testa conico-turrita. Turbo albulus. Faun. Gern., 4^{me}. Perhaps, nearly allied to *Littorina*.

Rissoa plica, Cantraine, Bull. de Brux. ix. 2, p. 346; smooth; milk white; columella with a fold above; allied to *R. monodonta*, Philippi: Sardinia. *R. subventricosa*, id. ib.; greenish horn coloured; narrow folds longitudinally with vertical stripes; labrum outwardly slightly emarginated: Ostia. *R. marmorata*, id. ib.; greenish; marbled dirty brown; white at the base; pointed with minute stripes: Sardinia. *R. punctum*, id. ib.; smooth; horn coloured; labrum inwardly slightly thickened; peristome complete; allied to the *R. punctulum*, Phil.: coasts of the Peninsula, Sant Antioco. *R. obtusa*, id. ib.; obtuse; smooth; horn coloured, yellow; three whorls; suture deep; peristome complete: Sardinia; rare. *R. sabulum*, id. ib.; obtuse; sub-umbilicated; smooth; horn coloured, grey; apex brown; four whorls; mouth roundish, marginated; peristome complete: Sardinia. *R. castanea*, *scrobiculata*, *globulus*, Möller, l. c. from Greenland. *R. caribæa*, *auberiana*, *gradata*, D'Orbigny.

Rissoina catesbyana, *sagraiana*, *elegantissima*, *striato-costata*, *browniana*, *sloaniana*, D'Orbigny: from Cuba.

Truncatella scalariformis, Reeve, from the Pacific. (Proc. Zool. Soc. p. 197.)

Ampullaria tasmanica, Le Guillou (Rev. Zool. 1842, p. 105); conical; five whorls; slightly striped; bay, with brown interrupted cross lines; umbilicus deep; 15 mill.: Van Diemen's Land.

Turritella lactea, Möller, l. c.; white; thirteen wavy ribbed whorls. *T. polaris*, Beck, ib.; grey violet, with twelve rounded, four cornered, smooth whorls. *T. costulata*; white, with twelve to fourteen cylindrical sharp ribbed whorls. *T. caribæa*, D'Orb., slightly undulated; whitish; twelve whorls: from Cuba.

Scalaria Eschrichtii, Holb., in Möller, l. c.; ten fine longitudinally striped whorls, the inferior quite smooth. *Sc. hotessieriana*, D'Orb., ten flat ribs; eight whorls; the last anteriorly furrowed across: Guadaloupe. *Sc. albida*, id.; narrow, oblique, leaf-like ribs; nine whorls. *Sc. foliaceicosta*, id.; high, posteriorly widened lamellæ; eleven whorls. *Sc. echinaticosta*, id.; undulating, four-bristled lamellæ. *Sc. uncinaticosta*, id.; rose-coloured, with high ribs, hooked posteriorly. *Sc. candeana*, id., is perhaps *Sc. acuta*, Pfr. Archiv. 1840, i. p. 256.

Lea describes a new species of the genus *Pasithea*, which he calls *sordida* (Sillim. Amer. Journ. xlii. p. 110). Adams declares it (ib. p. 392) to be a variety of *Odostomia trifida*, Gould; *Actæon trifidus*, Totten. He also remarks, that it is not from Boston, as Lea asserts, but from Dartmouth.

Actæon parvus, Lea, ib. p. 111; acutely conical, smooth, white, umbilicated, columella with one fold: Delaware Bay.

Lovell Reeve has published a monograph of the genus *Tornatella*, in which he reckons thirteen species; among these, seven are new. (Proc. Zool. Soc. 1842, p. 58.)

Pyramidella cincta and *glans*, Reeve. (Proc. sup. cit. p. 198.)

Recluz describes, in the Rev. Zool. 1842, p. 73, some new species of *Neritæ*:—*N. aurantia*, from the Philippines. *N. Essingtoni*, from New Holland. *N. (Neritina) cumingiana*, from the Philippines and the Moluccas. *N. (Neritina) phasiana*, from St. Domingo. *N. (Clithon) rugata*, from the Philippines. *N. (Clithon) sandalina*, from the South Sea Islands. *N. (Clithon) avellana*, from Manilla. *N. (Neritina) serrulata*, from Sumatra.

The same author remarks, ib. p. 177, that the *Neritæ* proper are essentially distinguished from the *Neritinae*, by the lateral summit of the surface of their columella being incised, and not by the teeth on the inside of the labrum. He also describes several additional new species: *N. corrosula*, New Guinea; *Longii*, Malabar; *Le Guillouana*, Salomon Islands; *maura* (Chemn. Conch. v. pl. 190, f. 1948-49, *atrata*, Lam.), Polynesia, Madagascar; *tenebrosa*, Solo Island, North of Borneo; *N. pisiformis*, Otaheite; *N. mittreana*, in fresh-water at Grasse in Provence; *N. (Clithon) souleyetana*, Otaheite; *N. (Clithon) obscurata*, Otaheite; *N. (Clithon) spinifera*, Island of Guaham; *N. (Clithon) menkeana*, Otaheite.

Some *Neritinae* by Souleyet, which were collected during the voyage of the Bonite, are to be found, ib. p. 269. *N. indica* appears to be *N. melanostoma* of the reporter. *N. sublata*, from the Philippines, is allied to *N. subcanaliculata*, Recluz. *N. touranensis*, allied to the preceding: Cochin-China. *N. vestita*, allied to *N. dubia*; the epidermis is drawn forward over the labrum: Philippines. *N. Gaimardii*; green, with black undulating longitudinal lines, lip without teeth: Cochin-China.

Neritina armstrongiana, Hinds' Annals, x. p. 82; black, spotted with golden yellow; spines upon the last whorl; lip with one blunt tooth: Marquesas Islands.

Recluz describes twenty-one species of *Neritæ* from Cuming's collection, among which are many new. (Proc. Zool. Soc. 1842, p. 168.)

Neritina tristis, D'Orb., Cuba; black with white points; four whorls; columella dentated. *N. microstoma*, id.; greenish with narrow black undulating longitudinal lines; perhaps *Listeri*, Pfr., Archiv. 1840, p. 255.

Lesson describes (Rev. Zool. 1842, p. 187) a new *Neritina* (*Neripteron*) *gigas*, which certainly, as Recluz, ib. p. 236, has already asserted, is identical with *Neritina granosa*, Sow. Recluz takes this opportunity of dividing the eared *Neritæ* into two divisions:—1. *Neripteron*; t. navicelliformis, labrum postice supernè et inferne productum, interdum utrumque canaliculatum. The species of this section are *N. auriculata*, Lam., *tahitensis*, Less., *navicellina*, Guillou, *bicanaliculata*, Recl., *subauriculata*, Recl., *Mauritiae*, Less. 2. *Clypeolum*; t. rotundata seu clypeiformis, labrum lateraliter dilatatum seu auctum. Species *N. latissima*, Brod., *curiosa*, Gray, *oveniana*, Gray, *rangiana*, Mus. Par.,

dilatata, Brod., *globosa*, Brod., *alata*, Sow., *Nuttalli*, Recl., *granosa*, Sow., *intermedia*, Sow., *labiosa*, Sow.

Recluz describes nine species of the genus *Navicella*, amongst which, *N. variabilis*, *cumingiana*, *clypeolum*, all from the island of Mindanao, are regarded as new. (Proc. p. 154.)

Le Guillou describes four new species of *Natica* in the Rev. Zool. 1842, p. 104:—*N. quadrfaciata*, from Mangareva; *N. candidissima*, from Vavao; *N. sandalina*, from Sandal Bay; *N. parvula*, from Borneo.

In Philippi's plates and descriptions of new shells, No. 1, there is one plate dedicated to the genus *Natica*, which contains, besides *N. reclusiana*, Desh., *duplicata*, Say, *heros*, Say, *triseriata*, Say, *plumbea*, Lam., *conica*, Lam., *semisulcata*, Gray, *consolidata*, Couthouy, several new species. *N. affinis*, v. d. Busch; oval, smooth, with white and red alternate bands, and red longitudinal streaks; umbilicus wide, with small spiral callosity: Hab.? *N. rhodostoma*, Phil.; white, with five rows of rust-brown spots; umbilicus open; columella and callosity of columella rose-coloured: Hab.? *N. alba*, Lovén; smooth; greenish-white; umbilicus quite closed; labium scarcely callous: Greenland. *N. pygmaea*, Phil.; white, with red points, and three indistinct bands; labyrinth forms partitions, whilst the whorls above are pressed flat to the suture: Hab.? *N. septentrionalis*, Beck., in Möller's Moll. Grönl.; spherical, grey-red; umbilicus concealed by a semicircular callosity; operculum chalky. *N. nana*, Möller, ib.; spherical, imperforate, white, operculum horny: both from Greenland. *N. uberina*, D'Orb., Cuba; smooth white, six whorls. *N. sagraiana*, id.; white, with brown undulating longitudinal lines; is perhaps *N. pulchella*, Pfr.; Archiv. 1840, p. 254. *N. lacernula*, id.; brown-red, with a white band anteriorly, sutures white.

D'Orbigny (Cuba) adds three new species to the genus *Natica*, Recl., viz.,—*N. sulcata*, *striata*, *lamellosa*.

AMAURA, nov. gen., Möller, Moll. Grönl. p. 7; Animal Naticis affine; pede parvo, compacto, lobo posteriore destituto, lobo anteriore profunde sinuato, oculis subcutaneis, ad basin internam lobi sitis; operculo terminali, paucospirato; testa ovata, imperforata, lævi, spira producta, apertura obpyriformi, circiter dimidiæ testæ longitudinis. *A. candida*; white, shining: Greenland.

Sigaretus helicoideus, Le Guillou, Rev. Zool. 1842, p. 105; milk white, furrowed vertically, striped longitudinally, with an umbilical cleft; 17 mill.: Amboyna. *S. (?) grælandicus*, Möller, l. c. p. 10.

Velutina lanigera, id. ib.; auriform, woolly, bright yellow.

Delphinula calcæroides, Cantraine, Bull. Brux. ix. 2, p. 341; testa parva, orbiculata, supra plana, infra convexa, late umbilicata; anfr. 3-4, ultimo bicarinato; carina superna spinis armata, inferna crenata;

apertur arotundato-compressa: Gulf of Cagliari. *D. tyria*, from New Holland, *imperialis*, *incisa*, *formosa*, and *aculeata*, from the Philippines, have been described by Lovell Reeve, Proc. p. 102. *D. tuberculosa*, D'Orb. (Cuba), has six knobbed cross ribs, and four whorls.

Rotella semistriata, D'Orb. (Cuba), whitish, with vertical stripes superiorly; beneath smooth, transparent. *R. diaphana*, id.; like the preceding, but without stripes; probably *R. pusilla*, Pfr. *R. carinata*, id.; keeled; in other respects like preceding. *R. striata*, id.; striped longitudinally, with open umbilicus. *R. anomala*, id.; smooth, keeled, with open umbilicus.

D'Orbigny (Cuba) divides the genus *Solarium* into two divisions. The *Solaria* proper have a depressed operculum with few whorls; interiorly with an elevated protuberance; the others (*Heliacus*) have a spiral conical operculum. To the latter division belongs *Sol. Heberti*, Desh.; *Sol. Philippii*, Cantr.; Bull. Brux. ix. 2, p. 344 (*Valvata striata*, Phil.): Sardinia. *S. bisulcatum*, D'Orb. (Cub.); two ribs on the periphery; above them five, beneath them six cross-ribs. *S. delphinuloides*, id.; cross-ribbed, white; trochiform. *S. inornatum*; frangible, smooth, with a light keel.

Lovell Reeve has laid before the Zoological Society seven species of the genus *Phorus*, Montf., amongst which four are new: *Ph. exustus*, *calculiferus*, *pallidulus*, and *corrugatus* (Proc. p. 160). All of them are figured in his *Conchologia Systematica*.

Clanculus Blainvillii, Cantr., Bull. Brux. ix. 2. p. 344; testa orbiculato-conoidea, umbilicata, nitida, lævi, albicante, lincis obliquis, plerumque angulatis, purpureo-lividis picta; anfr. 5 convexis, sutura simplice distinctis, ultimo depresso, umbilico mediocri, spirato, non crenato, albo; apertura ovato-depressa; labro intus sulcato, columella supra unidentatoplicata, infra subunidentata aut trituberculata: Tripoli.

Trochus asteriscus, *gemmosus*, *hanleyanus*, *modestus*: habitat of all unknown; *eximius*, from Payana; *melanostoma*, from New Holland, are figured in the *Conchologia Systematica* of Lovell Reeve (Proc. p. 184). *T. hotessarianus*, D'Orb. (Cuba), circular; umbilicated, with two lateral elevated stripes; variegated white, black, and red; columella with one tooth. *T. canaliculatus*, id.; circular, keeled, whitish, spotted wavy brown, umbilicated; one tooth on the columella.

Lacuna glacialis, Möller, l. c.; testa ovato-conica, rufo-fusca, anfr. 5 cylindraceis, plicis membranaceis angustis, cinereis, confertis ornatis.

Margarita glauca, Möller, l. c.; testa conoidea, lævi, opaca, albidolivida, umbilico mediocri, anfr. 4 cylindraceis, sursum crescentibus. *M. Vahlæi*, id. ib.; testa conoidea, hyalina, nitida, margaritacea, umbilico angusto; anfr. 4-4½ cylindraceis sursum crescentibus. *M. (?) costulata*, id. ib.; testa minuta, depresso globosa, lutea anfr. 3 sursum

crescentibus, cylindricis, plicis confertis transversim ornatis; umbilico angustiore; peristomate continuo, pæne soluto.

Phasianella umbilicata, D'Orb. (Cuba), umbilicated, with red points; white and red spotted; the last whorl angled anteriorly. *P. zebrina*, id.; umbilicated, with oblique lines and red or white spots; perhaps *P. punctata*, Pfr.; Archiv. 1840, p. 256. *P. brevis*, id.; umbilicated, white, with red or black points; spire very short.

Turbo ticaonicus and *variabilis*, from the Philippines; *pulcher* and *squamiger*; habitat unknown. Lovell Reeve (Proc. p. 185).

Conus victor, Broderip, Proc. 1842, p. 54; yellow, with white spots, and two dark brown necklace bands; Hab?

Marginella caribæa, D'Orb. (Cuba), yellowish, with three brown bands; labrum yellow, smooth. *M. abolineata*, id.; yellow-red, with three white lines. *M. subtriplicata*, id.; three folds on the columella. *M. ovuliformis*, id.; white, smooth; spire concealed. *M. lavallescana*, id.; appears to be *minuta*, Pfr.; Arch. 1840, p. 259. *M. sulcata*, id.; whitish, with two reddish bands; ribbed longitudinally; labrum toothed inwardly.

Ringicula semistriata, D'Orb. (Cuba), oval-conical; thick; whitish; cross-striped anteriorly; columella thickened, with two folds; labrum thickened in the middle, with a protuberance; 2 mill.

Olivina miliola, D'Orb. (Cuba), whitish, with undulating brown longitudinal lines; columella thickened, with one fold.

Voluta delessertiana, Petit, Mag. de Zool. 1842, pl. 57; spindle-shaped; ribbed longitudinally; margin of columella wrinkled vertically, with three folds at the base; labrum sharp, thickened externally; 56 mill.: Madagascar. Broderip has described seven varieties of *Voluta aulica*, in Proc. Zool. Soc. 1842, p. 53.

Mitra anais, Lesson (Rev. Zool. 1842, p. 142); t. ovato-turbinata, lævi, lutea, fuscis rufis angulatis ornata; labro dextro crasso unidentato, columella bi-tridentatave: Gambier Islands. *M. bicolor* and *casta*, Swains.; *Oliva tehuelcha* and *puelcha* are united in one species by the same author. *M. affinis*, id. ib.; t. cylindræa, lævi, grisea cum lineolis flexuosis nigris; suturis lineola æterna notatis; ultimo anfractu basi transverse sulcato et nigrosericeo, columella sextiplicata: Gambier Islands. *M. obliqua*, id. ib.; t. fusiformi, lævigata, immaculata, lutescente, fulvo cincta minutissime transversim striata, ultimo anfractu basi striato, columella quadriplicata alba: same habitat. *M. virginalis*, id. ib.; t. fusiformi-turrita, subulata, longitudinaliter transversimque striata, areolata, nivea, columella quadriplicata, labro externo denticulato: Taiti. *M. grænländica*, Beck in Möller, l. c.; spindle-shaped; reddish-brown; smooth; finely cross-striped; columella has four folds.

ADMETE, nov. gen. Kroyer in Möller l. c.; animal pede magno antice lato, truncato, postice lanceolato, capite parvo, rotundato; ore simplice (proboscide et membrana linguali destituto), tentaculis longis,

filiformibus, oculos minulos in tuberculis ad basin exteriorem ferentibus ; operculo nullo ; testa ovata, diaphana, fragili ; apertura ovata, antice vix subemarginata, columella arcuata, oblique truncata, labio tenui, recto. *A. criapa*, n. sp.

Lesson has made us acquainted* with some *Columbellæ* (Rev., Zool. 1842, p. 184) : *C. clathra* ; covered with strong longitudinal and vertical ribs, which form deep fossæ between each other ; three folds on the columella : Sandwich Islands. *C. buccinoides* ; allied to *lugubris*, Kiener ; with black ledges and red hollows between : Acapulco. *C. ampla* ; furrowed vertically ; labrum within has numerous folds ; 3-4 protuberances on the columella : Gambier Islands. *C. apthægera* ; brownish yellow, minutely striped across with regularly placed blackish laces ; longitudinal ribs point out the swelling of the last whorl ; mouth white, with purple on the columella, on which are white points : Acapulco. *C. pulicaris*, has longitudinal ribs, white, with regular rows of black stripes on them ; mouth white, with black spots on the labrum : Marquesas Islands. *C. digitalis* ; covered with little shields like a thimble ; white, with some yellow undulations ; mouth small, white ; columella with points and a pad. *C. philippinarum*, Reeve (Proc. p. 199).

Eburna japonica, Reeve, from Japan (Proc. p. 200).

Terebra pretiosa, Reeve (Proc. p. 200).

Buccinum obliquum is, according to Pfeiffer = *B. vitreum*, Pfr. (Rev. Zool. 1842, p. 26). *B. genetta*, Lesson, ib. p. 237 ; spindle-shaped, with brown-black streaks ; folded longitudinally ; striped vertically ; last suture has many warts : Oran. *B. affinis*, id. ib. ; reddish-green ; smooth ; labium dentated on the margin : Pacific. *B. phalena*, id. ib. ; small, shining, ribbed, striped vertically, ribs warty, white, with reddish lines on the spire ; labrum smooth, thickened internally, pointed : Acapulco. *B. floridanum*, id. ib. ; chestnut-brown, with white spots : South Sea. *B. tulipa*, id. p. 238 ; thick, shining, with undulating ribs ; between them numerous stripes with little white warts ; yellow : Acapulco. *B. pulicaris* ; small, knobbed, plaited longitudinally, grey, with black protuberances and white stripes : Sandwich Islands. *B. elegans*, from California, and *B. pyrostoma*, Reeve (Proc. p. 199). *B. undulatum*, Möller, l. c. p. 11. *B. scalariforme*, Beck., ib.

Planaxis circinnatus, Lesson (Rev. Zool. 1842, p. 187) ; red, deeply furrowed ; epidermis woolly, red ; mouth wide, toothed superiorly ; columella dentated : Acapulco. *Pl. areolatus*, id. ib. ; white, with red bands ; whorls with shields ; sutures granulated ; mouth small, toothed superiorly ; labrum furrowed internally : Taiti.

Ricimula iodostoma, Lesson, Mag. de Zool. 1842, p. 58 ; globular ; mouth violet (in the plate rose-red) ; epidermis brownish ; surrounded by brown lines and six black bands ; 18'' : New Zealand ; already defined in Rev. Zool. 1840. The same author describes two new species

of this genus in the Rev. Zool. p. 102. *R. rufostoma*; globular; knotty; mouth violet internally; at circumference white, with yellow stripes; labrum internally with six teeth; columella four wrinkles; three cent.: Gambier Islands. *R. monstrosa*; grey, wrinkled; margin of lip with six unequal digitations; mouth orange; five warts on labrum; three folds on the columella; twenty-four mill.: same habitat.

Some new species of the same author are added, ib. p. 186. *Purpura violacea*; testa parva longitudinaliter et transversim costata, cancellata, grisea; apertura violacea, obliqua, intus dentata; canali distincta, columella lævi: Gambier and Marquesas Islands. *P. aterrima*; t. ovata, nigra, spira brevi acuta, tuberculata, transversaliter funiculata; apertura ampla, nigra, labro tenui: Gambier Islands. *P. avenacea*; t. ovato-oblonga, fusiformi, atra, transversim striata; striis perlatis, apertura longitudinali, labro dextro lævi, columella rufo-castanea: same habitat. *P. bicolor*; t. ovata transversim tenuiter striata, grisea, striis nigris, anfractibus convexis, spira brevi, ultimo anfractu dilatato, apertura longitudinali purpureo-atra; labro dextro lævi, denticulis intus albis notato: South Sea Islands.

Oniscia Dennisoni and *strombiformis*, Reeve, Proc. 91: habitat unknown.

Sowerby's monograph of the genus *Aporrhais* contains three species:—*A. pespelecani*; *A. pescarbonis*, magis tenui quam *A. pespelecani*, canalibus elongatis, labio externo trilobato: Marc Medit.: and *A. occidentalis*; testa turrita concentricè plicata, spiraliter striata, canalibus brevibus, labio externo unilobato. Gray's *A. senegalensis* is omitted.

The monograph of the genus *Rostellaria*, by the same author, contains four species:—*R. curvirostrum*, Encycl.; *curta*, Sow. (Zool. Proc. 1842, p. 165); *rectirostrum*, Lam.; and *Povesii*, Petit MS. (?) The latter species has been described in the Rev. Zool. 1840, p. 326; and has appeared with a plate in the Magas. de Zool. 1843, pl. 53.

The monograph of the genus *Struthiolaria*, by Sowerby, contains also five species (ib.):—*S. straminea* (*Murex stramineus*, Gmel.); *S. nodulosa*, Lam.; *S. inermis*, Sow., Zool. Journ.; *S. gigas*, new species; stramineæ simillima, sed majore; angulo anfractuum rotundata, nodulis minoribus ornato; and *S. oblita*, Sow. Tankerville Catal. App. p. 18.

Sowerby enumerates fifty-eight species of the genus *Strombus*, ib., of which the following are new:—*S. crispatus* (Proc. p. 143); *S. Sibbaldii*; t. subclavata, lævi; spira parva, anfractibus angulatis, plicatis; ultimo magno, ventricoso, labio interno nigro-lineato; labio externo interne striato, medio sub-incurvo; sinu parvo: Ceylon. *S. coniformis*; t. conica, lævi, pallide fulva, fasciis brunneis interruptis cincta, valide angulata, spira brevissima, anfractibus ad angulum plicatis, apertura angustata, labio externo vix expanso; sinu parvo. *S. dubius*; form of a cone; labrum slightly drawn forward, and internally crenated. *S. elegans*;

t. subelongata, fusiformi, spira subelongata, anfractibus angulatis, ad angulum plicatis, in medio minute tuberculatis, antice sulcatis; ultimi margine varicosa, apertura ovali, striata. *S. hemostoma*; t. ovali striata, longitudinaliter plicata; apertura rosea, striata, labio externo sinu valido. *S. fusiformis*; t. fusiformi, lævi, antice subtruncata; spira conica anfractibus prope suturam unisuleatis, ultimo ad marginem striato, dorso subgibboso, apertura angustata, labiis intus striatis postice in canalem spiræ partem decurrentem attenuatis, externo oblique truncato, sinu antico parvo. *S. terebellatus*; t. elongata lævi; spira brevi, anfractu ultimo antice oblique truncato, apertura interne striata, labio externo vix expanso, paululum incrassato, sinu antico indistincto, subdentato. *S. bulbulus* (Zool. Proc. 1842). *S. glabratus*; t. subpyramidalis, nitida, apertura ovali, bicanaliculata, columella truncata; labio externo crasso, reflexo, antice subemarginato; operculo ovali; anfractu ultimo ad dorsum prope suturam plicato. *S. australis*; t. ovali, rugosa, spiraliter costata, spira elongata, anfractibus angulatis, plicato-tuberculatis, ultimo costis tuberculatis duabus; apertura lata, labio interno antice gibboso, labio externo ad anfractus duos elevato, valide expanso, unilobato, intus sulcato, postice costis duabus magnis, margine crasso, subinflexo, intus crenulato, canali recurvo: Australia.

Strombus ponderosus, Philippi (Abbild. u. Besch. neuer Conchylien, i. 1); white, with rusty yellow longitudinal spots; outer lip has five brownish vertical bands; whorls tuberculated, upon the last a compressed knob: Pacific.

Strombus Chemnitzii, Pfr., has been by Pfeiffer himself reckoned as identical with *Str. pavifrons*, Swains. (Rev. Zool. 1842, p. 26.)

Grimaud de Caux and Gruby have described the organ which contains the purple fluid in the *Murex brandaris*. This vesicle is two centimeters long, one and a half centimeters broad at the base, and is funnel shaped. It is situate at the upper part of the body, between the head and liver. This is properly the cavity of the lungs, it opens between the margin of the mantle and the body of the animal. The fluid contained in it, has, at the same time, been examined by the microscope; it is transparent and contains oval cells. (Comptes Rendus, vol. xv. p. 1007.)

Murex Cleryi, Petit, first described in the Rev. Zool. 1840, is now figured in the Magas. de Zool. 1842, pl. 54. The author is now inclined to consider this species as identical with *Typhis Belcheri*, Brod.

M. Steinforthii; habitat unknown. Reeve, Proc. p. 104.

Of the genus *Trichotropis*, Sow., two new species, from Greenland, are to be found in Möller, l. c., *atlantica*, Beck, and *conica*, Möll.

Mangelia Holbøllii, Beck, ib., testa conico-fusiformi, tenera, diaphana, albida, lævi, anfr. 7, convexiusculis longitudinaliter subtilissime striatis, ad suturam rugosis.

Many species of Miller's genus *Defrancia* are also to be found in Möller, l. c., all from Greenland, viz.,—*nobilis*, *scalaris*, *exarata*, *woodiana* (*Pleurotoma turricula*, Wood), *elegans*, *cinerea*, *Pingelii*, Beck, *Vahlüi*, Beck, *cylindracea*, *Beckii*, *livida*, *viridula* (*Tritonium viridula*, Faun. Grœnl.)

Fusus funiculatus, Lesson, Rev. Zool. 1842, p. 104; allied to *F. Petit-Thouarsii*, Kiener: Acapulco. *F. rosa-ponti*, id. ib.; yellow red, with regular tubercles; mouth rose coloured; six cent.: Gambier Islands; was, id. p. 212, by the same author, joined to *Fasciolaria*, but it wants the folds in the columella. *F. imbricatus*, id. ib. p. 212.; striped vertically; ribbed longitudinally; whorls concealed by small lamellæ; has two keels in the middle; six cent.: Chili, Peru. *F. pyruloides*, id. ib.; like preceding, but without longitudinal ribs; mouth yellow: Chili. *F. sinuatus*, id. ib., allied to *Fus. sinuatus*, but only twenty-six mill. long: Chili. *F. follicus*, id. ib.; rounded longitudinal ribs, intersected by wavy laces of leaflets, like a tile roof; between these tile-like scales, the laces are alternately rose coloured and white: Taiti. *F. frondosus*, id. ib.; similar to preceding; grey with some black laces: Marquesas Islands. *F. ventricosus*, id. ib.; oval; bellied with regular laces; without longitudinal ribs: Chili. *F. latericeus*, Möller, l. c.; bright red, with a glassy epidermis and projecting lines. *F. Kroyeri*, id. ib.; bay, with undulating impressed lines. *F. Holböllii*, id. ib.; white, smooth; epidermis brown yellow.

Fasciolaria sulcata, Lesson, Rev. Zool. 1842, p. 212; eight whorls, with broad longitudinal ribs, and alternating vertical laces; bay; twenty-four mill.: Acapulco.

Pleurotoma perlata, Lesson (Rev. Zool. 1842, p. 143); t. parva, ovato-oblonga, rufa, perlis niveis cincta, spira acuta, apertura ovali, canali elongata: Sandwich Islands. *P. funiculata*, id. ib.; t. parva, oblongata, turriculata, rufa, costis circularibus, undulatis lamellosisque tecta, spira acutissima, apertura longitudinali, scissura rotunda: Acapulco. *P. speciosa*, Reeve: habitat unknown. (Proc. p. 199.) *P. Beckii*, id. ib., from the Philippines.

Turbinella pacifica, Lesson, Rev. Zool. 1842, p. 211, allied to *T. crenulata*, Kiener, with rounded ribs; regular vertical stripes; eighteen mill.: Sandwich Islands. *T. taitensis*; about six ribs on the last whorl; labrum furrowed internally; columella has three or four pads; six mill.: Taiti. *T. purpuroides*; has the appearance of a *Ricinula*; columella has three vertical pads: Gambier Island.

T. imperialis and *vestitulum*, Reeve, Proc. p. 198. According to a remark of L. Pfeiffer, *Cerithium procerum*, Kiener, is = *C. martini-anum*, Pfr. of Lamarck, confounded with *C. vertagus*.

Cerithium lacteum, Kiener, must receive some other name, as that one has already been used by Philippi. Two species are united by

Kiener under the name of *C. stercus-muscarum*, Say, one of which only corresponds to it (Rev. Zool. 1842, p. 26). *C. cancellatum*, Lea, (Sillim. Amer. Journ. xlii. p. 111); sub-umbilicated; furrowed longitudinally; striped transversely; mouth beneath protracted to a canal.

Crepidula acuta, Lea (Sillim. Amer. Journ. xlii. p. 108); convex, smooth, brownish; apex pointed, straight; plate triangular, white; mouth elliptical: Delaware Bay.

Calyptræa cinerea, Reeve, Proc. p. 50, from Cape Horn.

Owen describes a new genus, *LITHEDAPHUS*. It differs from *Calyptræa* in having a second or ventral shelly valve. The head is long and sub-cylindrical; between the head and foot is found a peculiar process, like a second head, but which is only a duplicature of the mantle. The branchiæ are composed of two short parallel rows of conical processes. The snout encloses a long horny tongue. The species is called *L. longirostris*. (Proc. Zool. Soc. 1842, p. 147.)

POMATOBANCHIA.

OF this division, Möller only gives some new Greenland species.

Bullæa punctata; shell oblong, white, with fine pointed lines.

Bulla turrita; small, cylindrical, white, spire drawn forwards; a narrow umbilical cleft.

B. corticata, Beck; cylindrical, imperforate, yellow, with undulating longitudinal stripes; apex sunk, covered by the swell of the columella.

B. Reinhardii, Holb. (*B. insculpta*, Totten?) *B. subangulata*; bellied, yellow, angular in the middle of the whorl; spire flat.

GYMNOBRANCHIA.

MILNE EDWARDS has observed, in a *Calliopæa* at Nizza, peculiar canals which communicate with the anterior portion of the digestive canal. There are two longitudinal vessels from which many branches arise; the anterior go to the feelers, the others pass to the processes on the back, usually considered as gills, where they ramify two or three times. All these vessels are soon filled after the animal has taken food, and can be easily observed from its transparency. (Annales des Sc. Natur. xviii. p. 330.)

Joshua Alder and Albany Hancock have given descriptions of seven-

teen new species of *Nudibranchia*, which were found at Cullercoats, on the coast of Northumberland. (Ann. ix. p. 31.) They detected eyes in young individuals of *Doris repanda* and *Goniodoris nodosa*, behind the dorsal tentacula; the greater opacity of the skin generally prevents their being observed in older individuals. The new species are:—

Doris aspera; body depressed; white or yellowish; cloak filled with spiculæ, and covered with obtuse tubercles; branchiæ consist of nine small simply pinnated transparent white plumes; $\frac{1}{10}$ ". *D. depressa*; body much depressed, of a pale sandy colour, spotted with orange or reddish-brown; cloak covered with delicate pointed papillæ, and having spiculæ arranged transversely across the back; ten or eleven simple branchiæ in a horse shoe form; $\frac{3}{10}$ ". *D. repanda*; cloak covered with minute white granular tubercles; a row of sulphur yellow spots on each side; branchiæ consist of four or five broad tripinnate transparent white plumes. *D. similis*; body rather convex, with numerous conical white papillæ; branchiæ of nine narrow transparent white plumes, tripinnate, with a strong denticulated central rib.

Polycera ocellata; greenish black, with irregular ocellated spots of pale yellow; veil interrupted in front, continued along the sides of the head and back in an elevated ridge with scalloped edges, and terminating in two or three lobes or tubercles on each side behind the branchiæ; branchiæ three or four large flocculent plumes, tripinnate; $\frac{1}{10}$ ". *Triopanothus*, Johnston, may be the young of this species.

Tritonia felina; rough with small warts; spotted with reddish-brown and white; branchiæ stout, two or three times branched, six on each side of the back; 1". Considered distinct from *T. arborescens*, Cuv. *T. pulchella*; rose coloured, with small opaque yellowish tubercular spots; five pair of branchiæ, the front ones consisting of three branches.

Melibæa ornata; pale yellow, with pink streaks and spots; very much resembling *M. coronata*, Johnst.

Eolis rosea; white, tinged with rose colour and buff on the back; branchiæ arranged in fifteen or sixteen close-set transverse series, five or six in each on the sides of the back. *E. obtusalis*; ochrey-yellow, with reddish-brown blotches on the head and back; about twelve rows of branchiæ. *E. aurantia*; buff-coloured; ten or eleven rows of branchiæ. *E. olivacea*; pale yellow, sprinkled with white and orange-red or brown; six or seven rows of branchiæ. *E. hystrix*; white, with olive brown spots on the back, and a row of large blotches of the same along the sides; six or seven rows of branchiæ. *E. vittata*; pale buff speckled with fawn colour; head rather large and truncated in front; six or seven rows of branchiæ. *E. pallida*; whitish-yellow, with white and rose-coloured spots; branchiæ crowded. *E. minuta*; yellowish-white; branchiæ few; in about two clusters. *E. nana*; yellowish; branchiæ in seven or eight rows.

Arthur Hill Hassall gives some remarks on the *Gymno-branchia* found in Dublin Bay. (Ann. ix. p. 135.)

Lowe has described a new genus of *Gymnobranchia* (Proc. Zool. Soc. 1842, p. 51), and names it *PERPIDIA*. Corpus limaciforme, repens, oblongum; postice compresso-triquetrum, dorso abrupte cristatum seu alato-carinatum; apice attenuato, acuto. Caput antice veliferum; velo semicirculari, margine fimbriato-lacero, ciliolato; ore inter labia baccalia subtus, simplici. Tentacula duo. Orificium generationis ad colli dextrum. Branchiæ diplomorphæ; seu in medio dorsi circa anum stellatim ramosæ, arbusculiformes, ramis pectinato-ciliatis; et per latera utrinque longitudinaliter biseriatæ, conico-papilliformes, papillis apice subdivisis, ciliatis. One species, *P. maderæ*.

Möller also describes several new species in his Index Molluscorum Grœnlandiæ; viz. :—

Tergipes rupium; yellow, with six dorsal papillæ on each side, which are also yellow, with white tops and a yellow ring at the base. *Doris liturata*, Beck.; depressed, yellowish, with a broad chestnut-brown line on the back; sixteen branchiæ. *D. acutiuscula*, Stp. *Euplocamus Holböllii*; prismatic pale yellow green; anus in middle of back; three branchiæ.

ASPIDOBRANCHIA.

Emarginula conoidea, Lovell Reeve. (Proc. p. 50.)

CYCLOBRANCHIA.

Patella insessa, Hinds, Ann. x. p. 82; oval, brown, transversely striolate, internally white; apex with white spots: California.

P. cerea, Möller, l. c.; depressed, milk white, rough; vertex somewhat forward, yellowish.

Patelloida depicta, Hinds, Ann. x. p. 82; very small, linear, white, with irregular broken rays diverging from the apex; length four times the breadth: California.

Siphonaria characteristicæ, Lovell Reeve, Proc. 1842, p. 49; from Panama.

Parmophorus corrugatus, from Madagascar; and *P. intermedius*, from the Philippines, have been described by Reeve. (Proc. p. 50.)

TUBULIBRANCHIA.

Vermetus eburneus, Rceve. (Proc. p. 197.)

CIRRIBRANCHIA.

Dentalium longirostrum, Reeve. (Proc. p. 197.)

CONCHIFERA.

MILNE EDWARDS has discovered, in *Pecten glaber*, male and female sexual organs, and so proved the hermaphrodite nature of these animals. Annales des Sc. Nat. xviii. p. 321.

The ovarium is orange-coloured, and occupies the inferior and posterior half of the abdomen; a duct comes from it, which penetrates a portion of the testis, and runs between the basis of the tentacula to the top of the abdomen, terminating at the anterior end of the branchiæ. The testis occupies the larger anterior half of the abdomen, and is milk-white. In front, it passes into the foot, and ends in two small openings, which lie in the groove of the under margin. Another excreting yellow organ is found on each side before the muscle and under the anterior end of the branchia, and appears also by its outlet to stand in union with the foot. It may perhaps perform the function of an accessory gland.

Sowerby has described some new species of the genus *Pecten* (Proc. p. 163), viz.:—*P. pictus*, Philippines; *superbus*, *velutinus*, the latter from Madagascar; *serratus*, Philippines; *singaporinus*, Singapore; *crassico-status*, Japan; *albolineatus*, Philippines; *splendidulus*, Singapore; *pseudolima*, Philippines. All these are figured in his Thesaurus.

Arca galactodes, Benson; Annals, ix. p. 489; rhomboidal, anteriorly sub-angular, posteriorly rounded, multi-radiated, margin smooth, epidermis brown: Chusan.

Möller, l. c., adds three sub-genera to the genus *Nucula*, which he characterizes as follows:—

NUCULA; animal sine tubis exsertilibus, pede brevi, crasso, pallii parte solum inferiore aperta. Testa subtrigona, rotundata, antice latiore, prominente, postice obtusa, circumcirca arete claudente; serie dentium acute angulata; dentibus anterioribus planis. Two new species from Greenland are described: *N. corticata*, Holb., and *lenticula*.

LEDA, Schum. Animal tubis brevibus, tenuibus, rectis præditum, pede longo, tenui, flexili; pallio toto aperto, marginibus simplicibus. Testa transversim ovata, solidiore, antice rotundata postice plus minusve elongata, coarctata truncata, intus pariete rudimentali, quæ tubulos separare videretur, prædita, parte truncata, ubi valvæ paululum hiant, costis duabz obsoletis divergentibus, a natibus egredientibus, inclusa, serie dentium levius angulata, dentibus angulatis, imbriciformibus. *L. macilenta*, Stp., and *L. complanata*, are new species.

YOLDIA, Möller; animal tubis longis curvatis instructum; pede magno, valido; pallio toto aperto, marginibus postice ciliatis. Testa transversim ovata, fragili, antice valde, postice parum hiant, antice et postice rotundata, pariete rudimentali tubulorum destituta; serie dentium leviter angulata, dentibus angulatis, imbriciformibus. *Nucula arctica*, Gray, and *Y. angularis* (*Nuc. myalis*, Couth.?)

The genus *Unio* has been enriched by several new species in Philippi's description of new Shells. In the first number is found a plate, devoted to the species of this genus. *U. parvus*, Barnes, is figured, besides two that are new. *U. semigranosus*, v. d. Busch, from Mexico; roundish, compressed, mostly covered with oblong grains, blackish, internally dirty purple coloured. *U. graciosus*, Parreiss.; small, with radiated wrinkles: from New Holland.

Two species from Chusan are described by Benson; Annals, ix. p. 489. *U. (Theliderma, Swains.) Leaii*, and *U. (Theliderma) divergens*.

Lea has described many species in the Proc. of Amer. Phil. Society. In the volume for 1841, p. 30, there are eight species: *U. sapotalensis* and *tecomatensis*, from Mexico; *rajahensis*, from Calcutta; *bigbyensis*, Big., Bigby Creek; *crocatius*, Savannah River; *callosus*, Ohio; *duttonianus*, Savannah; *georgianus*, Stump Creek. Again, at p. 82, there are five species: *U. brumleyanus*, Warrior River; *regularis*, French Broad River; *moestus*, Do.; *sparsus*, Holston River; *argenteus*, Do.—*Anodonta gibba*, Benson, l. c., from Chusan; *A. montezuma*, Lea (Proc. Amer. Phil. Soc. 1841, p. 31), from Central America; *A. globosa*, id., from Mexico.

M. Neuwyler has given a zoatomical contribution on the organs of generation of *Unio* and *Anodonta* (Neue Denkschr. der Allgem. Schweiz. Gesell. Band. vi. Neufchatel, 1842). He holds that these animals are hermaphrodite, and the brown gland, which lies between the heart and abdomen, he considers to be the testis.

Castalia Duprei, Recluz, Rev. Zool., p. 305, without longitudinal ribs; dentibus cardinalibus tribus subverticalibus; dente laterali antica et mediana in valvula dextra exterius sulcata, postica biserrata; dente antica suprema, in valvula sinistra interius sulcata, posticalibus binis integerrimis; Brazilian Sea.

Marion de Procé, physician at Nantes, has made some observations on the motion of the *Mytilus edulis*, by means of its byssus. (Ann. des Sciences Nat. xviii, p. 59.) The author preserved an animal in a glass vessel, alive, for more than a month. It stretched its foot out of the shell, to a length of 30 centimeters, and fastened at the point the end of a byssus-thread to the glass.

Mytilus niger, Benson; Annals, ix. p. 489; testa oblonga, trigona; cardine unidentato; natibus subincurvatis, decorticatis, sub-epidermide albis, marginibus purpurascens; intus margaritaceo-splendida, margine purpureo: Chusan.

Modiola Chenui, Recluz, Rev. Zool. 1842, p. 306; furrowed longitudinally, yellow, with a broad brown band in the middle; hairy posteriorly: Brazil.

M. elliptica, Lea (Sillim. Amer. Journ. xlii. p. 107), with purple spots, radiated stripes, posteriorly and in front; crenulated at the margin: Delaware Bay. *M. pulex*, id. ib.; smooth, greenish with purple lines: Do. *M. senhousia*, Benson, Ann. ix. p. 489; epidermide olivacea, obscure radiata; ala natibusque strigis flexuosis spadiceis ornatis; basi leviter emarginata: Chusan. *M. cicerula*, Möller, l. c. p. 19; spherical; rough; green-yellow; 2". *M. vitrea*, Holb. in Möller (with *Myt. decussatus*, Mont.?)

Dreissena purpurascens, Benson, Ann. ix. 489; t. oblonga sub-quadrata, radiato-plicata, sub-epidermide albo purpureoque ornata; epidermide brunnea: Chusan.

Cardium aquilinum, Mitre, Ann. des Sc. Nat. xviii. p. 191; testa minima, tumida, subcordata, gibba, obliqua, inæquilaterali, flavo-virescente, maculis rufo-fuscis et albidis; costis planulatis, lævibus; natibus prominulis, rufescentibus; intus violacea; 6": Toulon. *C. elegantulum*, Beck in Möller, l. c.; transversely oval; white, with twenty or twenty-five fine tile roof-like ribs.

Lucina cristata, Recluz, Rev. Zool. 1842, p. 270; t. ovato-subtri-gona, depresso-plana, valvula sinistra planissima, dextra vix convexa, albido-vitrea, pellucida, concentrice plicata; plicis inferioribus striæformibus, postice attenuata, angulata, margine superiore oblique recta, acute crenata, antice rotundata, superne tenue arcuatim emarginata ac cristata; apicibus antice recurvis: Campeachy.

Cyclas Steenbuchii, Möller, l. c.; unequal sides; triangular; blunt anteriorly; bellied; smooth; greyish-yellow: Greenland.

Cytherea effossa and *excavata*, Hanley, Proc. p. 123. *Cyrena purpurea*, Lea (Sillim. Amer. Journ. xlii. p. 106; t. rotundato-triangulari, æquilaterali, subinflata, subcrassa, diaphana, et purpurea et alba, polita, striis transversis; natibus prominentibus; margine non crenulato: Delaware Bay. *C. obesa*, Hinds, Ann. x. p. 81; flavo-virente; dentibus lateralibus serrulatis; intus pallide violacea; Rivers, Feejee Islands.

O. tenebrosa, id.; fusco-virente, dentibus lateralibus serrulatis, intus violacea: from the same habitat.

Orbicula fuscata, Benson, Ann. ix. p. 490; fusco-virente, polita, intus et ad nates violacea, margine interiori plerumque nigrescente; extrinsecus sulcis crebris circumdata: Chusan.

Sanguinolaria iridescens, Benson, Ann. ix. p. 490; albida, exilissime transverse striata; latere postico subrostrato, subangulato, antico longiore, rotundato: Chusan.

Psammobia costata, Hanley, from New Zealand. (Proc. p. 122.)

Ps. decora, Hinds, Ann. x. p. 81; cinnamomeo-brunnea; valva dextra planiuscula, sinistra ventricosa; pallide violacea radiata; intus violacea: California. *Astarte globosa*, Möller, l. c. p. 20; triangular, belled, minute vertical stripes; yellow brown: Greenland.

Lovell Reeve gives a monograph of the genus *Crassatella*, in which nineteen species are mentioned, ten of them new. (Proc. 1842, p. 42.) They are all figured in his *Conchologia Systematica*.

Pandorina arenosa, Möller, l. c.; grey, with attached sand: Greenland.

Solen acuminatus, Hanley, from the River Hoogley, in the East Indies. (Proc. p. 122.)

Duvernoy's treatise on the animal of the *Ugulina rubra*, which has been briefly noticed from the Institute in last year's report, p. 404, has now appeared complete in the *Annales des Sc. Natur.* xviii. p. 110.

Professor Owen has published an account of the Anatomy of the *Pholadomya candida*, in the Proc. Zool. Soc. 1842, p. 150.

The animal exhibits the characters of the *Acephala inclusa*, being completely veiled in the cloak, which gives issue only to the siphonic tube and the foot; it presents, however, in addition to the pedal and the two siphonic apertures, a fourth orifice, at the under part of the siphon, which is of small size and circular form, and which appears to be a supplementary entrance for water to the branchiæ. This animal is distinguished from *Panopæa australis*, not only by an accessory bifurcate foot, but also by its undivided branchiæ.

Thracia inæqualis, Adams, Sillim. Amer. Journ. xlii. p. 145; Ann. x. p. 238; fragile, very inequivalved, striated, inequilateral, posteriorly truncated; left valve flat, right very convex; ossiculum lunate, semi-circular; 1' 2". *Th. myopsis*, Beck in Möller, l. c.; the latter doubts whether the species belongs to the genus *Thracia*.

The first number of the *Magas, de Zoologic*, 1842, contains a Treatise, by Frédéric Cailliaud, on the genus *Clavagella*.

The author ascribes the perforation of this animal into stone to a solvent acid, and supposes that it must be developed in very small quantities at the same time; otherwise the shell itself would be attacked by it. He supposes also, that the animal has it in its power to apply the acid to any place where it wishes to work; and that it can lessen its effects by diluting it with water, if the acid should endanger the shell. He supposes the small tubular openings, which Rang thought were for the passage of a byssus (which, however, is not to be found), are for filling up the cavities often left by other animals, in perforating the stone, and so closing up all entrance to its abode. They may be, however, quite accidental, and not special characteristics. These animals undergo great alteration at different periods of life, by which one may be misled to distinguish them into different species. The author reduces them to four, which he has figured on three plates, viz.,—*C. aperta*, Sow. (*C. lata*, Brod. and Desh.; *C. sicula*, delle Chiaje); *C. balanorum*, Scacchi; *C. elongata*, Brod., and *C. melitensis*, Brod.

TUNICATA.

THERE are some new species of this division, in Möller's work already quoted: viz.—

Cynthia glutinans; yellow, thin, covered with sand.

Ascidia monoceros; cylindrical, tuberculated, pale red, with a horny projection between the openings. *A. lurida*; flat, brown-grey, smooth; openings lateral, blackish.

Clavelina cristallina; spherical, pedicled, compressed above, clear like glass, minutely tuberculated, openings whitish.

Boltenia ciliata; kidney-shaped, brown-yellow, tuberculated, fringed with hairs; openings reddish; pedicle granulated, fringed at the end.

REPORT

ON THE

CONTRIBUTIONS TO THE NATURAL HISTORY OF INSECTS,
ARACHNIDA, CRUSTACEA, AND ENTOMOSTRACA,
DURING THE YEAR 1842.

BY

DR. W. F. ERICHSON.

A TREATISE, displaying profound research in the History of the Formation of Animals, "Über die rückschreitende Metamorphose der Thiere," by Rathke (Neuest. Schrift d. Naturf. Gesellsch. in Danzig, iii. Bd. 4 Hft. Beiträge zur Vergl. Anat. und Physiol. von Dr. H. Rathke, Danzig, 1842), is peculiarly interesting in the science of Entomology.

The author calls that phenomenon, where, in the regular course of the development of the animals, particular forms of the organism shrink up, or even disappear, "Retrograde metamorphosis" (rückschreitende metamorphose). This may either happen through dissolution (metamorph. retrogr. per dissolutionem), or through solution (met. ret. per solutionem). In the former case, the organs concerned become gradually melted away, while their elementary parts pass into the mass of the rest of the organism; in the second case, they are cast off with the cuticular coverings. This occurs with the hind legs of caterpillars, the legs of many parasite crabs, the eyes of several *Entomotraca*, as well as with some internal organs, as the branchiæ of the larva of the Dragon Fly. The first case must always precede the second; for, as the author remarks in regard to the eyes, where cornea, lens, and pigment are thrown off, the other parts

must become absorbed; in the same way, for example, in the legs, the muscles, &c., belonging to them must shrink up. Besides legs, the branchiæ of the larvæ of different insects—their simple eyes (which the author very correctly does not consider as corresponding to the future complicated eyes of the complete insect),—also the salivary vessels, and the jaw-feet of many *Decapoda*, which are afterwards absorbed, belong to the organs which are lost by the retrograde metamorphosis. This metamorphosis shows itself in the most striking manner, where the animals are fixed in the last stages of life, as the parasitic *Crustacea* and the *Lepadæ*. The consequences which the author draws from his researches are,—1st, That when, through the retrograde metamorphosis, a part has shrunk up, or even completely disappeared, another has normally formed itself, which compensates for it, or undertakes its function: 2d, That in rarer cases, a part of the body only, at one place, undergoes an absorption, whilst another is more highly developed; and, 3d, That by way of exception, individual portions of the body are lost without being replaced by others, as is chiefly the case in the lower *Crustacea*, where the author supposes, that all the functions, and with them also their organs, yield to the very highly important development and activity of the organs of propagation.

Kölliker has carefully investigated the incipient development of particular insects, viz.,—the formation of the larva in the egg of the *Chironomus zonatus*, which forms the *Alga gloconema*; of the *Simulia canescens*, Bremi, and of *Donacia crassipes* (?). (*Observationes de prima Insectorum genesi adjecta articulorum evolutionis cum vertebratorum comparatione*, Diss. Inaug. Scr. Alb. Kölliker. Turic. 1842, 3 tab.)

In the comparison with the development of the vertebrata, the author has arrived at the following conclusions:—1. In articulated animals, the germinating tissue is divided into a serous and mucous fold: 2. From the primitive part of the serous fold, the abdominal plates (visceral platten) sprout out towards the yolk, grow over it, and unite upon the yolk side of the egg; upon the opposite side of the fold are formed the dorsal plates; they do not grow together, but form themselves into the hind limbs: 3. The wings of insects are the lateral limbs: 4. The first traces of the vertebral column show themselves in the chain of abdominal muscles situate between the nerves and the intestinal canal: 5. The nerves (animalischen nerven) take their origin in the outer part of the serous fold; they are not, however, enclosed in a canal, but only covered by skin, as the dorsal plates are not united; the ganglion of the brain also takes its origin from the primitive part: 6. The organs of sense

belong to the primitive part of the serous fold : 7. The mucous fold and the intestines are formed from the primitive part towards the yolk, so that they pass from the form of a semi-canal to that of a canal : 8. The mouth penetrates the ganglion chain and the primitive part, as the parts of the mouth originate from the latter : 9. The anus has its place in the yolk part, or between it and the primitive part : 10. The liver springs from the intestines; the other glands originate by themselves. The heart is situate on the yolk side, between the serous and the mucous fold. The development of articulated animals is thus not so different from that of the vertebrated animals as has hitherto been supposed, but agrees in important parts. The author assents to the view first taken by Rathke and Geoffroy St. Hilaire, according to which, the abdominal side of the articulated animals corresponds to the dorsal side of the vertebrated; and adds also, that the legs of the articulated animals correspond to the dorsal plates of the vertebrated, which, in the former, grow to free limbs, in the latter, unite with those of the other side, and so form the canal for the spinal marrow, and only in fishes form themselves, in the dorsal fin, into a sort of organ of motion. The wings of insects, as above mentioned, correspond, according to the author's view, with the legs of vertebrated animals. The author considers the branchiæ of the *Crustacea* as corresponding to the wings of insects; but they are always united with the legs, and form themselves sometimes into organs of respiration, sometimes into organs for steering, since, in the *Crustacea* and *Entomostraca*, the original form of the legs is that of the cleft feet, one arm of which often becomes an organ of respiration (branchia).

If we should, as Oken has done, consider the wings of insects as branchiæ, the comparison may be made, partly with the larvæ of insects, partly with articulated worms. The researches and conclusions of the author, already ascertained by his microscopic observations in the region of physiology, deserve all attention; with regard to the history of development in the egg, the relation in structure of the vertebrated and articulated animals, can be most certainly explained; and, perhaps, the comparison between the two, which possesses much interest, may be farther conducted in a judicious manner. I must however confess, that I have no doubt, but that from a general comparison of the organization of both divisions of the animal kingdom, the conclusion must be drawn, that there is no actual identity of the parts of the body; but that a comparison can be instituted only in reference to the functions of the organs. So much the more important is it to compare the development of the egg in both.

Steenstrup's work, *Über den Generationswechsel oder die Pfortpflanzung und entwicklung durch abwechselnde*

Generationen, eine eigenthümliche Form der Brutpflege in den niederen Thierclassen. Copenhagen. 1842, 8vo., has attracted the attention of zoologists in a great degree.

In the articulated animals, the author recognises (p. 121) the phenomenon of the varied generation, only in the change of the swarms of the aphides, which lay eggs and also produce living young; but he finds also an allied phenomenon in the peculiar nursing swarm of wasps, bees, ants, and termites; the phenomena of life, however, arise in such variety and fulness in these classes of animals, that it is almost to be expected similar varied generation will also be discovered in other families, as soon as the attention of observers is directed to it. The propagation of gall flies (*Cynipsera*) at least in one respect deviating from the rule, might next richly merit the attention of physiologists (v. infr.)

We have followed, with interest, inquiries on the use of the antennæ. Of late years no new facts have come to light. Robineau Desvoidy alone (Ann. Soc. Ent. Fr. xi. p. 23), wonders that there is still doubt on this point. "He has already shown, in the year 1827, that, in the crabs, as the outer antennæ are evidently the seat of the sense of hearing, so the inner ones are the seat of that of smelling; and afterwards proved, in his *Recherches sur l'Organisation Vertébrale des Crustacés, Arachnides et Insectes*, 1828, that, in the *Isopodes*, the sense of hearing is no longer doubtful; in the *Arachnides* it is wanting, while, on the other hand, the parts pointed out as mandibles, are here organs of smelling, and the poison canal in them corresponds to the lachrymal passage of the higher animals. In the insects, the antennæ are organs of smelling, and usually also of touch. They have no organ of hearing at all."

INSECTA.

PARTIAL essays on this class have been laid before the Parisian Academy, by Percheron (Compt. Rend. d. Seanc. de l'Acad. de Sc. xiii. n. 24, and in *Froriep Neue Notizen*, xxi. p. 49), and by Brullé (Ann. d. Sc. Nat. xvii. p. 257).

Neither of these will be of any benefit to science, as they are not grounded on new researches on the different orders.

Percheron takes the parts of the mouth as characteristics of the first rank, and divides insects into Chewing (*Neuroptera*, *Orthoptera*, and *Coleoptera*), Chewing and Sucking (*Hymenoptera*), and Sucking (*Hemiptera*, *Diptera*, *Lepidoptera*). But where are the *Strepsiptera*, which can neither chew nor suck, and also all the wingless orders? •

Brullé considers, that the orders of insects are placed in two parallel rows, of which the one has the parts of the mouth adapted for chewing, the other for sucking. The *Strepsiptera* have occasioned some hesitation, to the author, because he did not know whether they chew or suck; and, indeed, they do neither. The *Hymenoptera* he has placed with the chewers, although they can also suck. Finally, the *Neuroptera* stand among the chewers, although a great division of them—the *Phryganeæ*, certainly do not chew. Again, the natural order of the lice is split, and the sucking ones have received the very improper name of an order, *Zoophaga*. The *Thrips* have also received another new name, *Malacoptera*.

The author has afterwards extended the idea of the double row to the whole animal kingdom (lib. cit. xviii. 50, 298); but also here in a manner equally useless, from his superficial knowledge of the subject.

Two treatises by Glaser, “Von der Uebereinstimmung zwischen den Characteren der Pflanzen und der an ihnen lebenden Insecten, im besondern der Schmetterlinge,” and “Parallele zwischen der Klasse der Insecten und dem gesammten Thierreich,” are to be found in the *Isis* (p. 6 and 13).

Esquisses Entomologiques, ou Histoire Naturelle des Insectes les plus remarquables, par M. l'Abbé J. J. Bourassé, Tours, 1842, 12 m. K. is only known to me by name.

Hope (Transact. of the Ent. Soc. of Lond. iii. p. 129), has arranged, together, all the insects which at different times have served for the food of man. Dierbach's “Uebersicht der gebräuchlichsten Arzneimittel des Alterthums mit besonderer Rücksicht auf die Werke des Dioscorides und Plinius, ein Pharmacologischer Versuch.” *Isis*, p. 103, is a work of like nature.

Siebold has arranged the previous observations on insects which have been infested by *Filaria*. (*Ent. Zeit.* p. 146.)

Villa has published a short paper (Note su Alcuni Insetti Osservati nel Periodo dell'Eclisse dell'8 Luglio, 1842, Milano, 1842), in which he describes the influence of the eclipse upon the manners of different insects, which he observed during its continuance. The insects, in general, were very restless, moved their feelers strongly here and there, and hid themselves. *Lepturæ* and *Cetoniæ* ceased to fly, and remained quiet upon the leaves. *Libellula flaveola*, which was present in great numbers, disappeared half an hour before the darkness, and appeared again half an hour afterwards. The larger *Hymenoptera* also disappeared. *Diptera*, on the other hand, flew till the commencement of the eclipse. The *Coccinellæ* were latest in concealing themselves. Nocturnal insects did not come out. I was once, many years since, during a total eclipse, in the open air, and made similar observations. The peculiar anxiety with which the insects sought to conceal themselves struck me most forcibly.

Remarks concerning insects are to be found, in Ratzeburg's *Forstwissenschaftliche Reisen durch verschiedene Gegenden Deutschlands*, Berlin, 1842, in Brehm's *Ausflüge nach Brinnis* (Isis, p. 409, 488, 566, 647, 752), and Küster's *Reiseberichten aus Dalmatien und Montenegro* (Isis, p. 283, 609, 743, 847).

The twenty-second number has appeared of Germar's *Fauna Insectorum Europæ*.

Souvenirs d'un Voyage dans l'Inde ex. de 1834-39, par Adolphe Delessert, Paris, 1843, ii. vol. 8, 35 pl., is of importance for a knowledge of Indian insects, which I here defer mentioning, as the portions on mammalia and birds have already been taken up in this year's report. The entomological portion has been executed by Guérin. The new species have been in part briefly characterized already in the *Rev. Zool.*, but they are here more minutely described, and some beautifully figured. In general, what has been said of the insects of the high lands of the Nilgherries, is particularly worthy of attention (T. ii. p. 3). The type of the European is here mingled with the Indian Fauna. The greater number of the species belong to European genera, and there are also found several indigenous to Europe, as *Coccinella 7-punctata*, *Vanessa Cardui*, *Polyommatus batiscus*; whilst, on the declivity of the mountains, we meet with pure Indian forms, *Ornithoptera Heliakon*, *Sternocera chrysis*, *Fulgora Delessertii*, *Macronota flavo-maculata*, *Mylabris Sida*, &c.

In the zoological numbers of the "Verhandl. over de Natuurl. Geschiedenes der Nederlandsche Bezittingen," a larger treatise by De Haan has appeared, which treats of the *Orthopterous* Fauna of Netherland-India, and will be mentioned afterwards.

The great number of insects collected by Cuming on the Philippine Islands, of which a complete series of species has been deposited in the British Museum in London, might well call forth a more extensive work, which would give a profound view of the peculiar relations of the fauna of this important group of the Indian world. These very important materials have only been partially examined, in different periodicals. During this year, for example, the *Cerambycidae* have been described by Newman, some *Curculionidae* by Waterhouse, and some Bugs by Ad. White.

The reporter has given a contribution to the Entomology of Van Diemen's Land in these Archives (8 Jahrg. 1 Bd. p. 83).

"A report on the Insects of Massachusetts injurious to vegetation, published agreeably to an order of the legislature, by the Commissioner on the Zoological and Botanical Survey of the State, Cambridge, 1841, 8vo," is a very learned work on the Natural History of the Insects of North America. The author, Th. W. Harris, is one of the most distinguished entomologists of that country, and has executed his task with

thorough knowledge and the greatest care. The book has been written for a wide circle; and while thus, on the one hand, it contains much which is only subservient to introducing the subject to general readers; on the other, it is rich in valuable information on the habits of North American Insects. As this work is probably but little known in Europe, I shall, in the course of this report, frequently draw attention to it.

The entomological portion of D'Orbigny's voyage, which had been intermitted for several years, has been renewed by Blanchard, and carried on with more research than his predecessor devoted to it. The text lying before us, reaches to the end of the *Clavicornia*. The plates are in advance, but they cannot be here noticed until the descriptions have also appeared.

The zoological portion of the Voyage autour du Monde, 1836-37, sur la Corvette Bonite, par M. Vaillant, Paris, 1841-42, is not yet accessible to me, so that a report upon it must be postponed.

COLEOPTERA.

HERRM. MEYER has analyzed the horny shell of Beetles. (Müll. Archiv. f. Anat. und Phys. 1842, p. 12.)

In order to remove from it the brittleness, which renders fine sections for microscopical research impossible, it is necessary to soften it for a long time in caustic potass. By this means an epidermis on both sides is removed, which is formed of one simple layer of cells, placed in rows next to each other. The internal epidermis is very thin, the walls of its cells are recognised with difficulty, and instead of the usual included substance, each cell has a spicula rising up obliquely in the middle of it. The middle portion of the horny shell is composed of small longitudinal fibres, which are united in layers by simple apposition, of which a greater or lesser number are joined together in order, so that the directions of the fibres of each layer cross at angles of 45° or 90° .* As to whether any peculiar connecting substance exists between the small fibres, the author is still doubtful. Between the external epidermis, and

* The original of this difficult passage is added.

Es lässt sich darauf an beiden Seiten ein Epidermisüberzug ablösen, der aus einer einfachen Schicht neben einander gereihter Zellen gebildet wird. Die inner Epidermis ist sehr dünn, die Grenzen ihrer Zellen sind schwer zu erkennen, und statt der kerns hat jede Zelle einen schrägen stachel, der sich in ihrer Mitte erhebt. Der mittlere Theil der Hornschale ist aus Stäbchen zusammengesetzt, welche durch Nebeneinanderlegung und Anastomosiren zu Schichten vereinigt sind, deren nach Umständen eine grössere oder geringere Zahl aufeinandergefügt sind, so das die Richtungen der Stäbe der einzelnen Schichten sich unter Winkeln von 45° oder 90° kreuzen.

the peculiar texture of the horny shell, the author observed a layer of pigment in the unsoftened pieces, which seemed to be composed of a homogeneous substance.

Observations on the History of the Metamorphosis of the *Coleoptera* have been published by Gourreau (Ann. d. Soc. Ent. d. Fr. xi. p. 173), principally in reference to the transformation of the Beetle from the nympha-membrane, and, in particular, of the *Pyrochroa coccinea*. The view very correctly taken by the author, that the spines and bristles, standing out on the covering of the nympha-membrane, serve to retain it in its place on the evolution of the Beetle, and thus render that operation easier, has already long been maintained by ourselves.

The reporter has continued his researches on the larvæ of the *Coleoptera* (Arch. 8 Jahrg. 1. Bd. p. 363), with reference to the division of the *Lamellicornes*, *Heteromera*, *Curculiones*, *Cerambyces*, *Cucujidæ*.

A knowledge of the larvæ is of great importance in the arrangement of the *Heteromera*, which present very important variations in this respect, according to their natural families. The larvæ of the *Melasoma*, *Tenebriones*, *Taxicornes*, *Helopice*; and *Cistelines*, agree very closely; and from that the idea has been derived, to unite all these divisions into one great natural family, which is also accurately enough divided from the rest of the *Heteromera*, by the characteristic marks of the Beetle. The *Serropalpi*, *Edemeridæ*, *Lagria*, *Pyrochroa* (*Pyrochroa* and *Pytho*), and *Mordella*, have peculiar forms of larvæ. The larvæ of the *Meloidæ* are only satisfactorily known in a very youthful state. Of those of the *Anthicidæ* and *Salpingidæ* nothing is known.

A comparison of some of the differences presented in the general structure of the body, by which the two sexes of Beetles are distinguished from each other, has been published by Hoffmeister (Sechster Jahresbericht über die Thätigkeit des Vereins für Naturkunde in Cassel, abgestattet d. 18. Apr. 1842, von Dr. A. Philippi).

Some remarks on the natural history of German *Coleoptera*, are to be found in the Entomol. Zeitung, viz.: Beiträge zur nähern Kenntniss des Lebens und Fanges einiger Coleopteren von Banse, Krasper und Matz in Magdeburg (p. 24): Entomologische Mittheilungen von Dr. Rosenhauer (p. 33, 50), und über die an und in alten Zäunen lebenden Käfer von demselben (p. 162.)

Schaum (Germar Zeitschr. iv. p. 172) has published a contribution to the knowledge of the Salt Beetles of Northern Germany; i. e. such beetles as are only found in the salt districts. They are confined to a few families. The half of them are *Carabicinae*. Next to these, Water Beetles, which live in brackish water (*Dytiscidæ* and *Hydrophilidæ*). Among the *Staphylinidæ*, some species of *Bledius*; and, besides these, only two of *Heterocerus* (*parallelus*, Gëhl., and *femoralis*, Ullr.); one *Pselaphus* (*Bryaxis Helferi*, Schm.); and one *Anthicus* (*humilis*).

A dissertation which has appeared in Vienna, "*Quædam genera et species Coleopterorum Archiducatus Austriæ nondum descriptorum*. Diss. inaug. Auct. Guil. Redtenbacher, Vind. 1842, 8," describes twenty-six species of Beetles, of which two only constitute new genera (v. inf.)

Héers "*die Käfer der Schweiz, mit besonderer Berücksichtigung ihrer geograph. Verbreitung*" (Pt. 1, No. 3), has appeared in the *Neu. Denkschr. d. Allg. Schweiz. Gesellsch. f. d. gesammten Naturwiss.* 5 Bd., and has besides been printed separately, 1841. This work keeps equal pace with the *Fauna Coleopt. Helv.*; and the above number corresponds to the third number of the latter work.

Hope (*Ann. of Nat. Hist.* ix. p. 494; x. p. 91) has described a number of new species from Western Tropical Africa, so rich in *Coleoptera*; also Imhof (*Bericht über die Verhandl. d. Naturf. Gesellsch. in Basel*, vom Aug. 1840, bis Juli 1842, v. Basel, 1843), which will be mentioned more minutely afterwards. Those of the former are mostly from Cape Palmas, those of the latter from the hill country of Aquapim.

Hope has made a contribution to the Fauna of Sylhet, by describing fourteen rare and beautiful Beetles, of which short characters are given in the Proceedings of the Linnæan Society (*Ann. Nat. Hist.* ix. p. 247). These are, seven *Lucanidæ*, one *Mimela*, one *Chrysochroa*, four *Longicornes*, among which is a new genus, *Zonopierus*, and one *Sagra*. More minute information on these species may be learned from the treatise itself. Of the new genus nothing can be at present said, as nothing very exact has been stated as to its position in the series of the *Longicornes*. Hope has mentioned a number of *Coleoptera*, collected by Cantor in Chusan and at Canton (*Proceed. Ent. Soc.* p. 60); but we cannot enter more minutely on them here, as the characters given of them are too superficial* to recognise the species, and often even doubts remain whether the genera are correctly defined. It is to be desired that a more exact description were given. A communication upon the Beetles of Port Essington, by Hope (*Proceed. Entom. Soc.* p. 43), possesses much interest for the Fauna of New Holland, as the north coast of New Holland was till then quite unknown; and the presence of several genera in New Holland is ascertained, which hitherto had not been known to occur there. To the latter belong *Copris* and *Megacephala*. The enumeration is partly incomplete, and the characters given are very meagre and uncertain.

Newman has published a list of Beetles, which were collected at Port Philip, on the south coast of New Holland (*Entomologist*, p. 351, 361, 401, 413). Were this catalogue complete, and the descriptions more

* For example, "Sp. 19, *Lagria nigricollis*, Hope. Flava, antennis, capite, thoraceque nigris; elytris pallide castaneis, villosis, corpore infra piceo, pedibus concoloribus." What, then, is yellow about the animal?

minute, an important comparison might be instituted between the Fauna of the continent of New Holland and the island of Van Diemen's Land, as the insects described by me were collected at Port Philip, a point lying exactly opposite to the latter.

CICINDELIDÆ.—This family has been subjected to a careful revision, in respect to their systematic division, by Lacordaire (Mém. d. l. Soc. Roy. d. Sc. de Liège, tom. i. p. 85). The author divides them into five groups:—I. *Manticoridæ* embraces the genera *Manticora*, *Platycheila*, *Amblycheila*, *Omus*.—II. *Megacephalidæ*, distinguished from the former as well as from the rest, by the peculiar length of the labial-palpi, particularly of the stem (erroneously taken by the author for its first joint). *Oxycheila*; *Centrocheila* (*Pseudoxycheila*, Guér.), differing from *Oxy.* by its triangular labrum, suddenly narrowed anteriorly, and elongated into a strong point, containing the *O. bipustulata*, Latr.; *Eurymorpha*, Hope; *Megacephala* (*Aptema*, Enc.), confined to *M. senegalensis*, which the author distinguishes from the other *Megacephalæ* comprised by Hope under *Tetracha*, by the completely rounded shoulders of the elytra. It is the only one that is wingless, for *M. 4-signata*, which the author separates as a wingless species in the genus *Tetracha*, is completely winged. There is therefore no sufficient generic distinction in the absence of wings, as we do not even find it sufficient for a specific distinction, it often enough occurs, that in such species as in general are unwinged, winged individuals are found, even independent of cases arising from difference of sex. For this reason, I consider that the distinction given by the author between *Megacephala* and *Tetracha*, is as little to be maintained, as he, with justice, has deemed those defined by Hope, according to the number of the teeth on the mandibles. *Aniara* (*sepulchralis*), the separation of which, though scarcely on sufficient grounds, yet appears less constrained. Lastly, *Iresia*. This genus cannot here be in its right place; it is more nearly allied in its habits to *Euprosopus*. The sculpture of the elytra resembles much the *Collyridæ*. In the structure of the antennæ only, *I. Lacordairei* shows the character of the *Megacephalidæ*. In the *I. binotata*, Kl., the labial palpi scarcely exceed in length the maxillary palpi; in *I. bimaculata*, Kl., they are even shorter; in *I. Beskii*, both are of tolerably equal length. This difference in the different species is so much the more striking, as the first three, at least, stand in the very closest relation, and the author could so much the less presuppose it, as he had only an opportunity of examining the first. It is also of consequence, as it shows that the relative length of the palpi affords no satisfactory mark of the *Megacephalidæ* and *Cicindelidæ*.—III. *Cicindelidæ*, the most numerous group. *Oxygonia*, Man., and *Cicindela*, including *Calochroa* and *Abroscelis*, Hope, *Cylindera*, Westw., and *Laphyra*, Dup., which the author shows as untenable, have simple labial-palpi and anterior tarsi, without an

impressed longitudinal line. The following have an indented line on the anterior tarsi: *Euryoda* (*Hepatodonta*, Hope, but which name the author rejects, as the labrum has only five crowded teeth), with a short transverse 5-7 toothed labrum (*C. analis*, F.; *4-punctata*, F.; *concinna*, Dej.; *versicolor*, Dej.; *Leprieuri*, Dej.; *festiva*, Dej.; *ornata*, Kl.; *colon*, Kl.; *mirabilis*, Brull.; *viridicyanea*, Brull.; all from the Old World). *Chilonycha* has a long three-toothed labrum, covering, in a great measure, the mandibles, and which, in the ♀, is produced into a spine; it differs from *Odontocheila*, by its short arched body, and is South American: *C. chalybea*, Dej. *Phyllodroma*, different from *Odontocheila* by a short 1-3 toothed labrum; habits rather similar: *Ph. ignicollis*, new species, probably Brazilian; *C. curtilabris*, and *aperta*, Kl., and *semicyanea*, Brull. *Odontocheila*, Lap., corresponding to Dejean's first division of *Cicindela*; *Plochionocera*, Hope (*nodicornis*), is quite correctly joined to it; *O. ventralis*, *distigma*, Dej., *sericina*, Kl., *rugipennis* and *tenebricosa*, Koll., form a small peculiar group, with shorter body, elytra more or less impressed (eingedrückten), of black hue with silky gloss, inhabiting woods, not found upon leaves, but on the banks of water. Lastly, those having the second joint of the labial palpi thickened: *Physodeutera*, in which also the second joint of the maxillary palpi is swollen (*C. Adonis*, Lap., from Madagascar); *Distipsidera*, Westw.; *Megalomma*, Westw. (I published some criticisms on these genera in last year's report); *Apteroessa*, Hope; *Dromica*, Dej.; *Euprosopus*, Latr.—IV. *Collyridæ*. The three known genera, *Therates*, *Tricondyla* and *Collyris*.—V. *Ctenostomidæ*. The genera *Psilocera*, Brull. (this name having been previously applied elsewhere, Klug's *Pogonostoma* is to be preferred); *Procephalus*, Lap.; *Ctenostoma*, Kl.; and *Myrmecilla*. The latter is founded on a small new species, *M. pygmaea*, from Brazil, differing from both the preceding by its longer labial palpi, while, in habit, it holds a medium between them. I must confess, that from our specimen of this Beetle, the difference does not appear to me very important, especially as it seems impossible, from a series of twelve species, which I have before me in the Berlin collection, to distinguish, in any satisfactory way, between *Procephalus*, *Ctenostoma*, and *Myrmecilla*.

Megacephala and *Cicindela* have been enriched with new species from several quarters. *Megaceph. nigricollis*, *elongata*, *violacea*, *gracilis*, Reiche (Rev. Zool. p. 239), are from New Granada. *M. australasia*, Hope (Proceed. Ent. Soc. p. 45), from Port Essington; the first species of this genus known in New Holland.

Cicindela litterifera and *subtruncata*, Chaudoir (Bull. de Mosc. p. 801), are from Astrabad, on the Caspian Sea; *Calochroa Strachani*, Hope (Ann. Nat. Hist. x. 91, 14), from Sierra Leone; *Cic. ocreata*, *cupriventris*, *Favargerii*, Reiche (Rev. Zool. p. 240), from New Granada;

and *C. ioscelis*, Hope (Proceed. Ent. Soc. p. 45), from Port Essington, in the north of New Holland.

Schmidt of Stettin has made some interesting observations on the larvæ of the *Cic. campestris* (Ent. Zeit. p. 270), from which it appears, that by night the larva leaves its habitation for prey. The pupa is also for the first time described and figured, figs. 9-11.

CARABICI.—Rosenhauer (Die Lauf und Schwimmkäfer Erlangens, mit besonderer Berücksichtigung ihres Vorkommens und ihres Verhältnisses zu denen einiger anderer Staaten Europas, Erlangen, 1842), and Suffrian (Die Caraben des Regierungsbezirks Arensberg, verglichen mit denen der Mark Brandenburg in Germ. Zeitschrift. iv. p. 149), have made some important contributions to the distribution of the *Carabi* (including the *Cicindelidae*) in Germany. The former has given a careful list of the species, with important remarks on their occurrence, and a comparison of the Fauna of Paris, Switzerland, Brandenburg, Sweden, and Lapland. The latter, on the other hand, goes very profoundly and carefully into the comparison with the Brandenburg Fauna. In general, the Mark is richer by fifty-five species than the Arnberg district, which wants the genera *Omophron*, *Licinus*, *Masoreus*, *Cephalotes*; whilst the genera *Callistus* and *Olisthopus* are present, which are not to be found in the Mark (*Olisthopus rotundatus* may, perhaps, have been found, at least I have met with it in Pomerania; but it appears to like a clayey soil, of which there is very little, at least in the neighbourhood of Berlin).

The *Carabi*, according to my experience, are, for the most part, very constant to one soil. The Fauna of Erlangen, where there is great variety of soil, appears to confirm this. It is richer by twenty-seven species than that of Arnberg; and although they agree in having fewer species altogether than Brandenburg, yet it differs from the Arnberg Fauna in being richer than it in most of the families; only the *Elaphrini*, *Licinini*, and *Chleniini*, have one, the *Scaritini* and *Anchomenini*, two species less. Whilst none of the species, native to Brandenburg, are missed, the Erlangen region has, besides, *Callistus* and *Olisthopus*, also *Polystichus*.

A remarkable fact, in Suffrian's treatise, is the presence of the *Carabus nodulosus* in the Arnberg Wood. His information on the presence of the *Car. purpurascens*, which, in Western Germany, represents the Eastern *C. violaceus*, deserves all attention. He considers them as one species. According to his statement, both are present at Mainz; and, according to Schmidt, *C. violaceus* is constantly found on hilly stony ground, *C. purpurascens* in moist meadows. They are also to be found in the Harz, where the reporter can add, that an intermediate species, *C. exasperatus*, Duft., of which we have a series in the Berlin collection, is also found; the extreme specimens of it are not to be distinguished, the one from *C. violaceus* proper; the other from *C. purpurascens*.

According to Rosenhauer, these three forms are found at Erlangen as well as in Austria. There are still some other forms of the *C. violaceus*, which are looked upon as peculiar species; and in other species, local varieties have been considered as species by entomologists, which Dejean, even against his own conviction, has had the modesty to describe as such.

Fischer von Waldheim (Rev. Zool. p. 270), wishes his genus *Calisthenes*, disallowed by Dejean, to be again established, as necessarily separated from *Colosoma* by its peculiar habit, and want of wings. This necessity acknowledged, we must often reckon one species to two genera, as it happens, that one and the same species is sometimes winged, sometimes wingless. The genus *Calisthenes* would thus require a better foundation. The author reckons in it three species: *C. Panderi*, *C. Motschoulskii* (*Car. orbiculatus*, Motsch.), and *C. Fischeri*, Mén., from the Chinese confines. Guérin adds a fourth species (ibid. p. 271), *C. Reichei* from Persia, distinguished from *C. Motschoulskii* by the smoothness of the upper surface, whilst the other, according to Motschoulsk, has a fine scaly coat.

The *Helluonides* have been subjected to a revision by Reiche (Ann. d. l. Soc. Ent. d. Fr. xi. p. 323), the group fixed, the genera hitherto characterized confirmed, and some new ones added. The division of the author is as follows:—The wingless are, *Omphra*, Leach, with truncated labrum; *Helluo*, with long labrum concealing the mandibles. The rest are winged: one group having three long spine-like lobes to the mentum, and (in *Macrocheilus*) the last joint of the labial-palpi cylindrical, or (*Acanthogenus*) triangular hatchet-shaped; in the other group the lobes of the mentum are short and broad, and the inner one remarkably shorter. The labrum is either short and truncate, as in *Planetes*, in which the posterior angles of the thorax are simple, and *Dialodontus*, in which they are reflexed; or has a projecting tooth in the middle, in *Pleuracanthus*; or it is long and covers the mandibles, in *Helluomorpha*. *Ænigma* is a ninth genus, the characters of which Reiche could not make out. The species are divided as follows:—

Omphra, East Indian; *hirta*, F. (*tristis*, Leach); *pilosa*, *atrata*, Kl.; and a new species, *O. complanata*, from anterior India.

Helluo, New Holland; *costatus*, Bon.

Ænigma, Newm., New Holland; *iris*, Newm.

Macrocheilus, Kirby, Hope, East Indian; *3-pustulatus*, Dej. (*Bensoni*, Hope, *4-maculatus*, Guér).

Acanthogenius, Reiche, new genus, Asiatic and African; *impictus*, Wied.; *grandis*, Dej.; *labrosus*, Dej.; *bisignatus*, Reiche (*bimaculatus*, Dej.); *biguttatus*, Gory; *distactus*, Wied.; *dorsalis*, Kl.; *cruciat*, Marc.; and a new species, *scapularis*, Reiche.

Planetes, MacLeay, East Indian; *bimaculatus*, MacLeay (*stigma*, F.,

which the author places here upon Hope's authority, does not belong to this group).

Dailodontus, Reiche, new genus, South American; *Cayennensis*, Dej.; *rufipes*, Brull.

Pleuracanthus, Gray, American; *sulcipennis*, Gray; *Brasiliensis*, *brevicollis*, *Lacordairei*, Dej.; *cribratus*, Reiche; *anthracinus*, *sanguinolentus*, and *ferrugineus*, Kl.

Helliomorpha, Lap., American. *Heros*, Gray; *agathyrnus*, Buq.; *bellicosa*, Lap.; *unicolor*, Brull.; *melanaria*, Reiche, new species; *femorata*, Dej.; *nigerrima*, *pubescens*, Kl.; *coracina*, Mannerh.; *sparsa*, Brull.; are South American, with slightly thickened antennæ and shorter thorax. *H. præusta*, *laticornis*, *nigripennis*, *Clairvillei*, Dej., are North American, with much thickened antennæ and longer thorax.

(*Hell. pygmaeus*, Dej., does not belong to this genus, but rather to *Diaphorus*, in Reiche's opinion.)

The family of the *Carabi* has been enriched with a number of new genera by Chaudoir (Bull. Mosc. 1842, p. 832); they have been copiously and accurately described, but the distinguishing characteristics have not been prominently noticed; other new genera have been founded by Waterhouse and others, so that during this year, these form a considerable series.

Rhombodera, Reiche (Rev. Zool. p. 313); allied to *Lëbia*; the thorax somewhat rhomboidal; the fourth joint of the tarsus simple; the claws with a blunt tooth at the base, without comb-like toothings. *Rh. virgata* from New Granada, and *Rh. atrorufa* from Brazil.

Glycia, Chaudoir (Bull. Mosc. 1842, p. 805), founded on the *Cymindis ornata*, Kl., an intermediate form between *Cymindis* and *Calleida*, agreeing with the former in the simple fourth tarsal joint, with the latter in the strong hatchet-shaped last joint of the labial-palpi.

Cceloprosopus, Chaudoir (l. c. p. 839), formed on the *Catascopus 4-maculatus*, MacLeay, which differs from *Catascopus* by wanting the tooth on the mentum; but how it differs from *Pericalus*, MacLeay, is yet to be determined.

Lobodontus, Chaudoir (l. c. p. 841), allied to *Thyreopterus*; the tooth on the mentum large and rounded. *L. trisignatus*; new species from South Africa.

Scopodes, Erich. (Archiv. 1 Bd. p. 123; t. 4, f. 1); mentum with very short side lobes, without a tooth; hind legs long and slender; eyes very large. *Sc. Boops*, new species from Van Diemen's Land.

Scariphites, MacLeay. Under this name Westwood separates (Arcana Ent. p. 157), a small group of the species of *Scarites*, from New Holland, as a sub-genus, which agree in the want of wings, the wide rounded abdomen, and the cylindrical last joint of the palpi. He has described three new species, loc. cit. p. 87, and beautifully figured them:—

Sc. Bacchus, from Swan River, *Sc. Lenæus*, from New Holland, *Sc. Silenus*, from Swan River; a fourth is afterwards added (p. 157), *Sc. MacLeayi*, from New South Wales; but it appears to me to be the same with *Sc. rotundipennis*, Dej., which is also found in Van Diemen's Land. (Vid. Arch. 1842, 1 Bd. p. 95.)

Gnathoxys, Westwood (Arcan. Ent. p. 89, t. 23, f. 2, 3), a distinct genus, whose position is still doubtful; the habit is like *Scarites*, as is that of *Baripus* and *Onemacanthus*; the head small, and the mandibles simple like *Pterostichus*; the antennæ and the exteriorly dentated tibiæ, as in *Scarites*, in which group the genus may for the present stand; the mentum is toothless on the emargination; the tarsi seem to be simple. To the two species figured, *Gn. granularis* and *irregularis*, from Port Essington, Reiche (Rev. Zool. p. 121) has added two other species, *G. obscurus* and *citaticosus*, from Swan River; and Westwood afterwards remarks (Arc. Ent. p. 158), that he has seen two East Indian species of this genus in Paris.

Mystropterus, Chaudoir (Bull. Mosc. p. 844), a genus of *Ditomidæ*, distinguished from *Pachycarus*, Sol. (*cyaneus*, Ol.), by the presence of a sharp tooth on the mentum, founded on the *Dit. cæruleus*, Brull. Exp. d. Morée.

Chilotomus, Chaudoir (ibid. p. 846), founded on the *Dit. chalybæus*, Fald. Col. Pers. Armen., without a tooth on the mentum, with united elytra, and the thorax produced behind.

Brachycælus, Chaudoir (ibid. p. 848), a genus of *Harpalidæ*, of the form of *Cratocerus*; mentum with a broad tooth; on the four anterior tarsi, the first four joints are widened, and have a thick coating of felt beneath. *Br. Duponti*, a new species from the Straits of Magellan.

Loxomerus, Chaudoir (ibid. p. 851) is certainly identical with *Heterodactylus*, Guér. (vid. last year's report, p. 206.) The new name, however, as the earlier one was no longer free, is as little superfluous as the exact description. The species is called *L. nebrionides*, and is the same with *Heterodact. nebrionides*, Guér.

Migadops, Waterhouse (Ann. Nat. Hist. ix. p. 136, t. 3, f. 2, 3), resembling *Selenophorus*; the dilated tarsal joints of the male have a thick downy felt beneath; a double tooth on the emargination of the mentum. In *M. virescens*, from Terra del Fuego, *M. falklandicus*, from the Falkland Islands, *M. Darwinii* and *nigrocæruleus*, from Terra del Fuego, the intermediate tarsi of the male are evidently dilated; whilst, in the *M. ovalis*, from Terra del Fuego, the first two joints only are dilated in a slight degree.

Megalostylus, Chaudoir (Bull. Mosc. p. 855), allied to *Pæcilus*, with an obtuse rounded tooth on the mentum, and the first joint of the antennæ very long; founded on five species from New Orleans, which, however, are not described.

Abropus, Waterhouse (Ann. Nat. Hist. ix. p. 134, t. 8, f. 1), formed from the *Metius splendidus*, Guér.; differing from the *Metius harpaloides*, Curt., which is the type of the genus *Metius*, by its *Anchomenus*-like form, as well as much longer antennæ, and labrum not distinctly emarginate in front; but the most important difference is in the structure of the tarsi, the penultimate joint of which is distinctly bilobed, and furnished beneath with membranous appendages in both sexes. *Abropus* approaches very nearly to *Antarctia*, the only essential difference is, that *Antarctia* has no appendages on the fourth tarsal joint.

Amblytelus, Erich. (Arch. 1842, i. p. 129, t. 4, f. 2), is a distinct genus of *Pterostichina*, which is distinguished particularly by the bilobed fourth tarsal joint; and in this, as well as in the colour, approaches many *Truncatipennæ*; the only species is *C. curtus*, F.

Lestignathus, Erich. (ibid. p. 132, t. 4, f. 3), is a genus of *Anchomenina*, with one new species, *L. cursor*, from Van Diemen's Land, distinguished principally by the broad toothed mandibles crossing each other.

Ophryodactylus, Chaudoir (Bull. Mosc. p. 832), allied to *Dyscolus*, differing only by the tooth on the mentum being cleft; the tarsal joints are deeply furrowed at the sides, so that they seem to have a padded border. *O. subviolaceus* is a new species from Brazil.

Paranomus, Chaudoir (ibid. p. 835), also allied to *Dyscolus*, and, as it seems, chiefly distinguished by the tooth on the mentum being somewhat emarginate at the point. *P. L'herminieri*, new species from Guadaloupe.

Homothes, Newman (Entomologist, p. 402); very nearly allied to *Euleptus*, Klug, differing chiefly in its form, as the thorax is much narrowed posteriorly; the elytra, more rounded at the sides, flat, striated, "lanugine sericatâ maculatim ornata." *H. elegans*, from Port Philip; a second species is *Euleptus sericeus*, Erich. (Arch. 1 Bd. p. 131, 17). The essential characteristics of the genus are still to be ascertained; it will then be shown if it is really different from *Euleptus*.

Cyphosoma, Hope (Proceed. Ent. Soc. Lond. p. 46), and *Cyrtoderus* (ibid. p. 47), I do not understand, and therefore can only name them. The former is between *Ænigma* (*Helluo*) and *Catascopus*, the latter appears to its author to be allied to *Zabrus*. The species *Cyphosoma unicolor* and *Cyrtoderus australasia*, are from Port Essington.

Molpus, Newman (Entomologist, p. 413); of this also I know nothing worth mentioning. The author has not pointed out its position. From its very large eyes, it might be joined to *Scopodes* (vide supra), but the notice of it is very slight. *M. 6-punctatus*, from Adelaide, appears at least to be different from the *Sc. boops* of the reporter.

The number of species newly described is great. Of European species there are *Dyschirius salinus*, Er. Schaum (Germ. Zeitschr. iv. p. 180),

found in all the salt countries of north Germany; *Harpalus truncatus*, *Amara planiuscula*, Rosenhauer (Lauf und Schwimmkäf. Erlangen, p. 12, 21), from Erlangen; and three mentioned by Redtenbacher, from Austria (Coleopt. Austr.) viz.,—*Elaphrus Ullrichii*, Dej., on the banks of rivers; *Pterostichus Justusii*, Spitzzy, from the Austrian Alps; and *Stenolophus humeralis*, which is only known to me by description, and resembles *Radister humeralis*.

Chaudoir has made a considerable contribution to the knowledge of the *Carabi* of Western Asia (Bull. d. l. Soc. Imp. de Nat. de Moscow, 1842, p. 601), by publishing a list of the species collected by Karelin at Astrabad, in the province of Masanderan, amounting to seventy-six, and of which many are new. *Drypta angustata*, perhaps too hastily distinguished, from one specimen only, by several "plus" and "moins," from the *D. emarginata*, which is also native there; *Zuphium longiusculum*, resembling *Z. olens*; *Brachinus annulicornis*, *elegans*, *biguttatus*, *gut-tula*, *scutellaris*; *Anthia Mannerheimii*, nearly allied to *A. sexguttata*; *Scarites crenulatus*, *persicus*; *Clivina lævifrons*, *Elaphrus impressifrons*, *Panagæus elongatus*, Mann., not differing, in Chaudoir's opinion, from *P. trux major*; *Chlœnius dimidiatus*, *fulvipes*, *auriceps*; *Dinodes angusticollis*, *Karelinii*; *Pogonus micans*, *Anchomenus discophorus*, principally distinguished from *A. prasinus* by the larger dorsal spot; *Agonum obscurum*, *Calathus dilutus*, *Pœcilus Karelinii*, *lævicollis*; *Bothriopterus lævicollis*, *Pterostichus subcordatus*, *Pseudomascus deplanatus*, *Lissotarsus reticulatus*, *Cephalotes longicollis*, *Leirus parallelus*, *Amara persica*, *Celia abbreviata*, *Acinopus eurycephalus*, *emarginatus*; *Ophonus atrocyaneus*, *Harpalus cribripennis*. The fauna, in general, agrees pretty closely with the European; even the newly characterized species do not appear satisfactorily different. The presence of an *Anthia*, which, perhaps, is the same with the Indian, is remarkable.

Some East Indian species have been described by Guérin in Delessert's voyage: *Helluo 3-pustulatus*, Dej., which was joined as a variety with the *H. 4-maculatus* of the Rev. Zool.; *Orthogonius lateralis*, from the Island of Penang; *Chl. bilunatus* belongs, as a variety, to the *Chl. neelgheriensis* of the Rev. Zool.; *Chl. Lafertei*, from Pondicherry.

Of the African Fauna, ten new species are to be mentioned, which Lucas discovered in French Barbary, and which are described in the Ann. d. Sc. Nat. xviii. p. 60: *Cymindis setifeensis*, *leucophthalma*; *Scarites Le-Vaillantii*, *Ditomis ruficornis*, *Nebria variabilis*, very like *N. brevicollis*; *Olisthopus puncticollis*, *Pœcilus barbarus*, *Numidicus coarctatus*, *Zabrus distinctus*.

Hope has also characterized a number of new species from tropical Africa, principally from Sierra Leone (Ann. Nat. Hist. x. 91): *Desera viridipennis*, *Galerita anthracina*, *Calleida nigriventris*, *Eurydera*

bifasciata, *Orthogonius latus*, *longipennis*, *Strachani*, *dubius*; *Catascopus Savaigi*, *jucundus*; *Ozæna lutea*, *Scarites Savagei*, *Panagæus Savagei*, *Raddoni*, *Sayersii*, *Klugii*, *tropicus*, *Erichsoni*, *Strachani*, *grossus*. Imhoff has also described a number of species from Guinea (Verh. d. Naturf. Gesellsch. in Basel, v. p. 164): *Calosoma Guineense*, *Catascopus femoralis* (*Savagei*, Hope, *Westermanni*, Dej. Cat.); *C. nigripes* (*jucundus*, Hope, scarcely differing from the *C. senegalensis*, Dej.); *C. specularis*, *Panagæus grandis* (*grossus*, Hope); *P. scabricollis*, *Epomis alternans*, *Morio guineensis* (*senegalensis*, Dej.), differing from *M. orientalis*, by the somewhat broader form and coarser inner striae of the elytra.

Reiche has made a considerable contribution to the knowledge of South American *Carabiceæ*, in the Rev. Zool. p. 241, 272, 307, by the description of a number of new species from Columbia, principally from New Granada. These are,—two species of *Casnomia*, one *Cordistes*, one *Leptotrachelus*, two *Galerita*, two *Cymindis*, thirteen *Calleida*, three *Dromius*, two *Aspasia*, five *Lebia*, one *Coptodera*, two species of the newly characterized genus *Rhombodera* (vide sup.), of which one, however, is Brazilian. This work is to be continued in the next year's publication.

The Fauna of New Holland has been enriched from many quarters. The following are from Port Essington, with the exception of the *Ænigma unicolor*:—*A. cyanipenne*, *Cyphosoma unicolor* (vide sup.), *Catascopus australisæ*, *Gnataphanus* (?) *licinoides*, *Cyrtoderus australisæ* (vide sup.); Hope, Proceed. Ent. Soc. p. 46. From Port Philip: *Calleida suturata*, *Lebia callida*, *luctuosa*, *luculenta*, *benifica*, *irrita*, *mollis*; *Feronia Philippi*, *Anchomenus* (?) *nigro-æneus*, *Homotes elegans* (vide sup.); Newman, Entomologist, p. 367, 401. From Van Diemen's Land: *Calosoma Schayeri*, *Scopodes* (vide sup.) *boops*; *Plochionus australis*, *Calleida pacifica*, *Cymindis curtula*, *inquinata*; *Harpalus verticalis*, *promptus*, *vestigialis*; *Pterostichus* (*Pæcilus*) *prolixus*, *coracinus* (*Argutor*), *sollicitus*; *Anchomenus marginellus*, *ambiguus*; *Euleptus sericeus*, *Dyscolus australis*, *dilatatus*; *Lestignathus* (vide sup.) *cursor*, Erich., in the Archives, 1842, i. p. 122-34.

Westwood has laboured excellently, with rich materials, at the *Scaritidæ* of New Holland. The genus *Carenum*, Bon., forms a principal element—a pure New Holland form, with which *Arnidius*, Leach, is identical, and to which the author also joins *Eutoma*, Newm. Eleven species are mentioned (Arc. Ent. i. 81, t. 21-23), of which six have been previously described: *C. Bonellii* (*C. cyaneum*, Bon.); *marginatum* (*Arnid. m.*, Leach, Boisd.); *perplexum*, White; *cyaneum* (*Scar. cyan.*, F.); *Spencei*, Westw.; *inctilatus* (*Eutoma*), Newm.: two, *C. smaragdulum* and *megacephalum* (*Eutomus megacephalus*), from Port Essington, also published by Hope (Proceed. Ent. Soc. p. 46): three,

C. politum, from Van Diemen's Land, *C. gemmatum* and *sumptuosum*, from Port Essington, are new. A twelfth species is *C. loculeum*, Newm. (Entomol. p. 369, Westw. Arc. Ent. p. 158), from Port Philip. The *Scarites* proper belong mostly to the peculiar form which was above mentioned, under the name *Scariphites*. One species only, *Sc. sculptilis*, does not belong to this, but is nearly allied to *Sc. lateralis*, Dej. The treatise includes also the new genus *Gnatboxys* (vide sup.); and there is a beautiful plate of the *Sc. Schröteri*, Schreib., on which, as the names given it of *Heteroscelis* and *Hyperion* are already occupied, the generic name *Campylocnemus* was bestowed by Westwood.

Haliday has published, as his opinion on the systematic position of *Adelotopus* (Entomol. p. 305), that the almost wholly smooth antennæ and compressed tarsi of the genus point out its situation among the Water Beetles; that it differs in essential points from the *Gyrinidæ*, and for the present must, therefore, be joined to the *Dytiscidæ*; that *Adelopus* does not live in the water. The beetles are to be found, according to Davis's report, under the bark of *Eucalyptus* (ibid. p. 306). There would be no reason against this opinion, did not the swimming tarsi form an essential character of the *Dytiscidæ*, and the *Adelotopus* has none. Besides, the antennæ are not smooth; in *Adelotopus*, they are certainly more thinly haired, but in the allied genera they are just as thickly so as in the rest of the *Carabi*.

Newman (ibid. p. 365), following Haliday, would establish for these beetles a peculiar order (!), in the same rank with the *Carabites*, *Dytiscites*, and *Gyrinites*, and standing in the middle between them, under the name of *Pseudomorphites*. The number of the species of this group has received an accession, particularly those of the genus *Adelotopus*: *A. hæmorrhoidalis* Erich. (Arch. 1842, i. 126, 50), from Van Diemen's Land, is perhaps the same with *A. inquinatus*, Newm. (Entomol. 366, 50), from Port Philip; also *A. scolytides*, Newm. (ibid. n. 51), from the same place; *A. dytiscides* (ibid. p. 365, note), from Adelaide; and *Silphomorpha guttigera*, Newm. (ibid. p. 367, 52), from Port Philip.

DYTISCI.—Rosenhauer (die Lauf und Schwimm-käfer Erlangens) has given a correct list of the *Dytisci* of Erlangen, and a comparison with other fauna. Erlangen has 89 species, Switzerland nearly the same (87 species): Sweden, 103, and Mark Brandenburg 100, are richer: Lapland 73, and Paris 72, poorer. (According to the investigations of Apetz, Osterland [Gotha, or Upper Saxony] has 75 species; the difference principally lies in the genus *Hydroporus*.)

The true *Colymbetes consputus*, Sturm, has been determined by Kiesenwetter (Ent. Zeit. 88). It is distinguished from *C. collaris*, not only by its larger and broader form, but also in the marking of the elytra, and especially in the formation of the fore claws in the male.

Two new European species of *Hydroporus* have been described by

Aubé (Ann. d. l. Ent. Soc. d. Fr. xi. p. 229). *H. Schaumei* is from Sicily, *H. polonicus* from Warsaw. Of the latter, the description of the male is added (ibid. p. 345). A third new species is *H. lautus*, Schaum (Germ. Zeitschr. iv. p. 187), from Mansfeld Salt Lake.

Kiellerup (Krøyer's Nat. Tidsskr. v. p. 318, 337) asserts, that *Haliphus fluviatilis*, Aubé, is identical with *H. ruficollis*, and *H. lineatus*, Aubé, with *H. obliquus*, as they pass into each other. I have not observed such transitions. *H. fluviatilis* and *ruficollis* are very evidently distinguished; neither have I ever found *H. obliquus* and *lineatus* in company. *Haliphus ater*, Redtenbacher (Coleopt. Aust. p. 8), allied to the *H. impressus*, but quite black, appears to be a doubtful species, and the more so, as one individual only has been found.

New New Holland *Dytisci* are *Eunectus helvolus*, Erich. (Arch. 1842, i. p. 134), from Van Diemen's Land; and *Cybister insularis*, *Colymbetes monostigma*, and *Hydroporus collaris*, Hope (Proceed. Ent. Soc. p. 47), from Port Essington.

Schödte has given a description of the azygos system of nerves of the pharynx in the *Acilius sulcatus*, in Krøyer Naturh. Tidsskr. iv. p. 104, t. 1.

GYRINI.—The German *Gyrini* have been subjected to a complete revision by Suffrian (Ent. Zeit. p. 219). The presence of the *G. strigipennis*, Suffr. (*striatus*, Aubé), in Northern Germany (at Elberfeld and Stettin), is worthy of attention. With *G. marinus* Suffrian joins *G. æneus*, Leach, *æratulus*, Steph., as well as a variety *G. anthracinus*, St., and *G. dorsalis*, Gyll.; but he considers the *G. æneus*, Aubé, as the same with *G. opacus*, Sahlberg, so that the former represents the species, the latter a dark blackish variety. Finally, he separates a third species, *G. nitens*, Parr., from both these, which is found in the South of Europe, and which unites to the form and the smooth interstices of the striae in both sexes of the *G. mergus*, the black inflexed margin of the *G. marinus*. The remark which the author appends, that he has often observed the *Orectochilus villosus* swimming about, in the day time, on the surface of water, is chiefly important on this account, that it does away with an opinion expressed by Ahrens, that the *O. villosus* is a nocturnal insect, and prevents this from becoming, through frequent repetition, an accredited fact.

Dineutes Gouldii and *Gyrinus iridis*, Hope, are new species from Port Essington, in New Holland. (Proceed. Ent. Soc. p. 48.)

STAPHYLINI.—Holme has published some remarks on the habits, manners, &c. of British *Brachelytra* (Trans. Ent. Soc. Lond. iii. p. 108). They chiefly refer to Stephens' Illustrations. The author remarks, in an appendix, that many of the supposed species in that work Stephens himself has reduced in his Manual, which has since appeared, and that a still greater reduction must be made, since he has convinced himself,

by an inspection of Kirby's collection (Stephen has arranged his work on this family chiefly from Kirby's MSS.), that many of the typical specimens are only immature individuals of well known species; but he has unfortunately lost his notes. Several species are defined as new: *Staphylinus semipolitus* (perhaps *fuscatus*, Gr.), *Raphirus nigricornis*, *Omalium mesomelas*. They all appear to me doubtful.

Märkel has discovered and described five new and distinct species among the *Staphylini*, which live in the nests of the *Formica fuliginosa* (Ent. Zeit. p. 142); they all belong to the group of *Aleocharæ*, and are, *Myrmedonia cognata*, *laticollis*; *Oxyopoda vittata*, *Aleochara inquilina*, *Euryusa acuminata*.

Lathrobium longicorne, Redtenbacher (Col. Austr. p. 8, n. 5), appears to me the same with *Lath. angusticollis* (Gen. et Sp. Staph. 593-7). Jacobson remarks, in reference to the doubts raised by me about the *Lathr. elongatum*, Gyll. (Kröyer Naturhist. Tidsskr. iv. p. 344), that he has found, among a number of Scandinavian individuals, some agreeing with Gyllenhal's, as well as some with my description; whether, and how they are different, except in the formation of the penultimate segment of the abdomen in the male, is not more exactly mentioned.

Aubé has described several *Staphylini* from the south of Europe (Ann. d. l. Soc. Ent. d. Fr. xi. p. 234); *Ocypus siculus* and *planipennis*, from Sicily, are allied to the *O. pedator*; *Pæderus lusitanicus*, from Portugal, similar to the southern variety of the *P. littoralis*, but distinguished by the smaller spherical thorax, longer elytra, and legs nearly black, is particularly easy to be recognised from the black intermediate femora, which in the *P. littoralis* are yellow.

The reporter has described *Aleochara speculifera* as a new species from Van Diemen's Land (Arch. 1842, i. p. 134).

Blanchard has published the *Staphylini* of D'Orbigny's voyage. The new species are, *Staphylinus luctuosus*, from Bolivia, placed by the author near *St. villosus* and *variegatus*, and compared with the *St. erythrocephalus*, but should, perhaps, stand nearer the *St. erithacus*; *St. janthinipennis* near the *St. saphirinus* and *hilaris*, from Bolivia; *St. cribratipennis*, *ibid.*; *St. nigrescens*, from Monte Video, near the *St. fuscicornis*, Germ.; *St. chrysopterus*, Brull., from Bolivia, a good and distinct species, the bad figure of which induced me, doubtfully, to refer it to *St. nobilis*; *St. tristis*, Bl., from Monte Video; *Philonthus Gaudichaudii*, from Rio Janeiro, *Ph. rubromaculatus*, from Monte Video, *Ph. pallipes*, from the islands of Paraná, all three with five-punctured striae on the thorax; *Sterculia splendida*, from Bolivia, distinguished by the golden red posterior part of its body, incorrectly called *fulgens* on the plate by Brullé, and also so cited by myself; *Cryptobium basale*, from the islands of Paraná; *Cr. erythrothorax*, from the district

of Rio Janeiro, both compared with *Cr. bicolor*; *Lathrobium fulvipes*, from the islands of Paraná; *Pinophilus maius*, Brull., from Corrientes; *P. cribratus*, from Brazil; *P. lividipennis* and *obscurus*, from the islands of Paraná.

BUPRESTIDÆ.—Harris has published some information on the habits of North American *Bupresti* (Ins. of Massachus. p. 40). *B. (Chalcophora) virginica*, Drury, which shows itself towards the end of May and in June, is like our *B. mariana*; the larva lives in the wood of the different species of pines, and becomes very detrimental to these trees. *B. (Dicerca) divaricata*, Say, preys on the wild (*Prunus serotina*) and garden cherry, also on pear trees. The larva of the *B. (Dicerca) lurida*, F., is more exactly described; it lives in the hickory. *B. (Chrysobothr.) dentipes*, lives in oak stems. *B. (Chr.) femorata*, F., in fig trees, also on white oaks. *B. (Chr.) fulvoguttata*, Hafr. (New Engl. Farmer, viii., *Tachypteris Drummondi*, Kirby), lives in the stems of the white pine. *B. (Chr.) Harrisii*, Hentz (small glittering bluish-green; the sides of thorax and the thighs, in the ♂, copper-coloured); lives as a larva in small boughs and shoots of the same tree.

The reporter has described three new species from Van Diemen's Land; *Stigmodera virginea*, *Melobasis hypocrita*, *prisca* (Arch. 1842, i. p. 135).

Bertolini has given an ample description of the natural history of the *Bupr. Fabricii* (Nov. Comm. Acad. Scient. Bonon. v. p. 87, t. 8); the larva lives in the wood of the pear tree, and is very prejudicial.

EUCNEMIDÆ.—*Nematodes strepens*, Redtenbacher (Col. Aust. p. 9), is *Tharops melasoides*, Lap., *Isorhipis Lepaygei*, Dej.

ELATERIDÆ.—In the Proceed. Zool. Soc. of Lond. (1842, p. 73), is to be found a notice of a paper of Hope's, on a division of the *Elateridæ*, which is defined as a peculiar family, *Phyllophoridæ*. It contains the genera *Phyllophorus*, H. (*El. gigas*, F.); *Tetralobus*, Serv. (nine species); *Piezophyllus*, H. (two new species); *Oxynopterus*, H. (*El. mucronatus*, Ol., and four new species); *Leptophyllus*, H. (a new species); *Pectocera*, H. (two new species). The genera are all new except *Tetralobus*; but I am not able to give their essential characteristics from the descriptions published; and as the author himself refers us to the plates by Westwood, we must wait for these before entering more particularly on this treatise.

Germar (Zeitschr. iv. p. 43), has arranged a peculiar group out of those *Elateridæ*, in which the forehead is gradually flattened anteriorly. The new genus, *Crepidomenus*, was established by the reporter in the Archives (1842, i. p. 140); it differs from the others by the third and fourth tarsal joints having beneath them a heart-shaped membrane. There are three species described, *C. fulgidus*, *decoratus*, and *tæniatus*, all from Van Diemen's Land. Among the others with simple tarsi, in

some (A.) the thighs are inwardly hollowed and abruptly widened : *Ludius*, Latr., *Beliphorus*, Esch., *Tomiccephalus*, Latr., *Hemiops*, Esch. *Ludius*, with a distinctly separate apparent joint at the point of the eleventh joint of the antennæ, contains *El. ferrugineus*, L. ; *L. coracinus*, from North America ; *El. theseus*, Germ. ; and *L. decorus*, new species from Valparaiso. *Beliphorus*, Esch., having the eleventh antennal joint undivided and slender, was first characterized by the articulation of the hind leg being at the angle of the dilated thigh ; it is confined to the *B. cecrionoides*, Esch., from the Cape ;* the other species mentioned by Esch., *El. mucronatus*, Ol., which he did not know, has been described as a different genus, and been named by Hope *Oxynopterus* (vide sup.). *Tomiccephalus*, Latr. (*Megacnemius*, Esch.), has also a simple eleventh antennal joint, but the thighs are considerably dilated towards the inside at the bend ; the only species is *T. sanguinicollis*, Latr. *Hemiops*, with its labrum emarginated anteriorly, contains *H. flavus*, Lap. (*luteus*, Dej.), from Java ; *H. nigripes*, Lap., Germ. ; and *H. chinensis*, new species from China. In the others, (B.) the thighs are gradually dilated internally. *Corymbites* has only the second antennal joint small, the third of the form of the fourth. *Diacanthus* and *Pristilophus* have the second and third antennal joints small, the third at least narrower and shorter than the fourth. In the former, the thorax is shorter, and the elytra become broader behind the middle. This distinction, however, does not appear to me satisfactory. I would rather say, that in *Diacanthus*, the mouth is covered by the prosternum, in *Pristilophus* it remains free ; in which case, at least, Latreille's typical species, *E. melancholicus*, would remain in the latter genus, and *D. corporosus* and *submetallicus*, two new species from North America, *costalis*, Payk., and *guttatus*, Dej., would belong also to *Pristilophus*. *P. levigatus* ; *Reichei*, a new species from South Carolina ; and *morio*, F. ; which together form a small sub-division with projecting mesosternum ; also *æthiops*, Hbt., and *insitivus*, Germ. (*depressus*, Meg.), are to be placed under *Diacanthus*. Thus, *Corymbites* contains twenty-five, *Diacanthus* twenty-eight, and *Pristilophus* thirteen species. Finally, *Cardiorhinus*, Esch., differs from the former by the emarginated labrum. The number of its species mentioned is not more than eleven, but the author has not had the use of the Berlin collection during his labours at this genus.

Germar (ibid. p. 98) has brought together the species of the genus *Campsosternus*, taking Hope's enumeration as his basis. (Vide Ann. Nat. Hist. viii. p. 453.) A number of Hope's species are either unknown

* *Beliphorus*, Esch. mit ungetheiltem 11. Fühlergliede, und sehr schmalen, erst an der Einkerbung der Hinterbeine im Winkel erweiterten Schenkeldecken ist auf den *B. cecrionoides* Esch. von Cap beschränkt.

to him, or somewhat doubtful, from that gentleman's unsatisfactory diagnoses. Some species are added, viz.,—*C. violatus*, Bengal, *foveolatus*, Malabar; as well as several more exactly described, viz.,—*C. Latreillei*, Dej., from Cochinchina, probably agreeing with Hope's species of the same name, which is therefore retained; *C. scutellatus*, Chev., from Manila.

There is still another new species to be added, which Guérin (Deless. Jour. d'Voy. dans l'Inde, ii. p. 37) has described under the name of *Camposternus Latreillei*, and which appears to be different from all the others, in having a fine white coat of hair, more or less thick: it was discovered at Pondicherry.

Redtenbacher has described three Austrian species (Col. Aust. p. 11): *E. (Ampedus) fulvus* is a small beetle, which differs from *Ampedus* by its membranous appendages on the tarsal joints, so that *E. (Sericosomus) lugens* should rather belong to *Ampedus*. *E. (Ectinus) subcencus*, Ziegl., appears to me properly to stand under *Pristilophus*. Desvignes (Entomologist, p. 326) has characterized a new British species, *Elat. rufitarsus*, which appears to belong to *Ampedus*, and to be allied to the *E. nigrinus*:

Agrypnus grandis, Hope, is a large New Holland *Elater* from Port Essington. (Proceed. Ent. Soc. p. 48.)

Of the Fauna of Van Diemen's Land, the reporter has described (Arch. 1842, i. p. 136) one new species of *Iacon*, six of *Monocrepidius*, one of *Melanoxanthus*, one of *Pristilophus*, three of the new genus *Crepidomenus* (vid. sup.), and also one new genus *Atelopus*, allied to *Dolopius*, but removed from the other genera with an arched forehead, by the fourth tarsal joint being provided with a membranous appendage; containing four new species. As the name *Atelopus* is already in use among the amphibia, it should be altered to *Acroniopus*.

RHIPICERIDÆ.—Three new New Holland species of *Rhipicera* have been recorded by Westwood. (Proceed. Ent. Soc. 64.) *Rh. attenuata*, *pumilio* (from Swan River), and *brunnea*.

CYPHONIDÆ.—The reporter has described a new species of *Cyphon* from Van Diemen's Land, *C. australis* (Arch. 1842, i. p. 144).

LAMPYRIDÆ.—Dieckhoff (Ent. Zeit. p. 117) has published his observations on the light emitted by the species of *Lampyris*; he proceeds on the supposition that it serves the insect as a protection against animals of prey. Robert (Ann. d. Sc. Nat. xviii. p. 379), relates, that he had a *Lampyris* ♀ in his hand, which shone so brightly that he could read small writing when held near it; a ♂ was found, and, after a few moments, the sexes had united; that then the light, which was at first bright, gradually lessened, and after half an hour was completely extinguished. When he cut a *Lampyris* ♀ transversely into two pieces, the light gradually disappeared in about the same space of time, but it could be again called forth if the posterior parts of the body were placed near a lighted

candle, perhaps, in consequence of the heat; but it was only within the first thirty-six hours that this took place, and but once.

LYCIDÆ.—The reporter has remarked (Arch. 1842, i. p. 100), on the genera *Lycus*, *Lygistorpterus* (*Dictyopterus*, Guér.), *Porrostoma*, and *Metriorhynchus*, that they contain the species with a proboscis; but that only three of them can be maintained: *Lycus* (distinguished by the rudimentary mandibles), and *Lygistorpterus*, both with antennæ at the base of the proboscis; and *Porrostoma*, with them attached to the forehead. Each of these has a long and a short proboscal division; *Metriorhynchus*, Guér., is the short proboscal division of *Porrostoma*.

In the same volume (p. 144), several species are described from Van Diemen's Land; *Porrostoma erythropterus*, *P. (Metriorh.) rufipennis* (the true *Lyc. rufipennis*, F.), *P. (M.) marginatus, discoideus*; *Anarhynchus scutellaris*. Buquet has made known five South American species of the form which corresponds to the genus *Dictyopterus*, Guér. (Rev. Zool. p. 6): *L. regalis, humeralis*, from Bogota; *3-fasciatus, imperialis*, from Columbia; *4-costatus*, from Brazil. It is to be remarked, that the first species, *Lycus succinctus*, Latr., is in Humboldt's collection, and that the generic name, *Lygistorpterus*, used long ago by Mulsant, is to be preferred to that of Guérin, which Latteille has used in another sense.

TELEPHORIDÆ.—Redtenbacher has characterized *Cantharis nigripes* as a new species from the Schneeberg, in Austria (Col. Aust. p. 13); but it is the same with *C. barbara*, F., *pallida*, Rossi; which, besides Barbary, is also found in Portugal, Italy, and Switzerland. *Cantharis nobilitata* of the reporter; is a new species from Van Diemen's Land (Arch. 1842, i. p. 146).

MELYRIDES.—Redtenbacher has described a new Austrian species of the *Malachii* (Col. Aust. p. 14), *Anthocomus festivus*; the reporter has described another from Van Diemen's Land (Arch. 1842. i. p. 147), *Attalus abdominalis*.

Graells has described a new Spanish *Dasytes*, allied to the *D. nobilis*, but of flatter shape, as *D. ciliatus* (Ann. d. l. Soc. Ent. d. Fr. xi. p. 221, t. 10, f. 3-6). It lives on the flowers of *Cistus monspeliensis*, and *albidus*.

CLERII.—A comprehensive work on the *Clerii*, founded on the Berlin collection, has appeared by Klug in the Schriften der Königl. Acad. der Wissensch, "Versuch einer systematischen Bestimmung und Auseinandersetzung der Gattungen und Arten der Clerii, einer Insecten familie aus der Ordnung der Coleopteren." Systematical arrangement is here difficult, as the genera are very nearly allied to each other; numerous repetitions of individual forms and colours occur in each, so that the appearance is quite deceptive; besides, a great number of smaller divisions and groups are found, which are neither sufficiently marked

for genera, nor do they stand in immediate connection with the forms taken as typical. Under these circumstances, the author, in order to avoid the error of splitting too much, has chosen the plan of determining a limited number of genera, but distinguishing all the variations which occur within them; and noting, as sub-genera with their own names, those farther removed.

First, the genera with five distinctly jointed tarsi.

I. *Cylidrus*, divided into two groups,—1. (*Cylidrus*, Spin.) with a concealed labrum: *C. cyaneus*, F., *fasciatus*, Lap., and two new species, *C. abdominalis*, from Brazil, *balteatus*, from the Cape; and, 2. (*Denops*, Stev.) with the front of the head emarginated and the labrum free: *albofasciatus*, Charp.

II. *Tillus*.—A. Claws twice toothed before the tips.—1. (*Tillus*) Body slender, antennæ long and serrated: *T. elongatus*, to which *T. hyalinus*, Sturm, and *bimaculatus*, Don., are joined as varieties.—2. Body slender, thorax constricted, antennæ doubly pectinifid: *T. pectinicornis*, new species, native country unknown.—3. (*Cymathodera*, Gray) Antennæ filiform, last joint gradually becoming pointed, not much longer than the preceding: *Hopei*, Gr., *cylindricollis*, Chev., *inornatus*, Say, and four new: *marmoratus* from Mexico, *prolixus* and *conflagratus* from Orinoco, *cingulatus* from the Cape.—4. Antennæ shorter, sub-serrated, the last joint as long as the two preceding: *T. compressicornis*, new species from the Cape.—5. (*Macrotelys*, Kl.) Antennæ ten-jointed, the tenth as long as all the others together: *terminatus*, Say.—6. (*Tilloidea*, Lap.) Antennæ short and serrated, labrum transverse: *T. rubricollis*, Guér. (*pubescens*, Lap.), *transversalis*, Charp., *unifasciatus*, F., and a new species, *notatus*, from the East Indies. B. Claws with only one tooth before the tips.—7. (*Callitheres*, Dej.) The last joint of the labial palpi transverse (quergezogen); peculiar to Madagascar: a. (*Pallenis*, Lap.) Antennæ broader towards the tips, serrated from the fifth joint, tarsal joints of equal breadth, tips of elytra rounded continuously: *tricolor*, Lap., and two new species, *aulicus* and *viduus*. b. (*Jodainus*, Lap., *Callitheres*, Spin.) Antennæ broader and serrated towards the tips, the first two joints of the hinder tarsi somewhat compressed, elytra elongated and pointed: *acutipennis*, Lap. c. (*Xylobius*, Guér.) Antennæ broader towards the tip, compressed, with the last joint rounded, tarsal joints of equal breadth, tips of elytra rounded continuously: *azureus*, Kl., and three new species, *venustus*, *longulus*, *pulchellus*. d. Antennæ as in c, tarsal joints and tips of elytra as in b: *fastigiatus*, new species. e. Antennæ scarcely serrated near the tips, tarsal joints and tips of elytra as in a: *auricomus*, new species.—8. (*Philocalus*, Kl.) Palpi the same, antennæ bluntly serrated, body elongated: *succinctus* and *zonatus*, from the Cape.—9. (*Cleronomus*, Kl.) Antennæ thickened

towards the tip, thorax short: *biplagiatus* (*bimaculatus*), new species from Mexico.

III. *Priocera*, Kirby; four species: *P. variegata*, Kirby; *trinotata*, new species from Columbia; *spinosa* (*Cl. spinosus*, F., *Till. 6-punctatus*, Lap.); and *P. bispinosa*, new species from Brazil.

In the following genera the first tarsal joint is shorter, but yet distinctly recognisable.

IV. *Clerus*.—1. (*Omadius*, Lap.) Eyes close, upon the top of head, deeply emarginated beneath, claws dentated, hinder tarsi with the joints indistinctly separated, and the penultimate one only having a double-flapped appendage: *a*. Tarsal joints compressed, triangular from the sixth; thorax cylindrical, oblong: *Cl. prolixus* (*O. indicus*, Lap.), and one new species, *Cl. modestus*; both from Java.—*b*. Joints of the antennæ oblong, narrowed at both ends, thorax rounded on the sides, constricted posteriorly: *Cl. nebulosus* (*O. trifasciatus*, Lap.).—2. (*Stigmatium*, Gray). Eyes and claws as in 1, the hind tarsi formed like the others: *cicindeloides*, Gray, and *mutillarius*, F.—3. (*Thanasinus*, Latr.) Eyes distant, on the top of the head, emarginated beneath, antennæ with (generally three) broader terminal joints, claws toothed beneath, tarsal joints of equal length; the typical group, containing forty-five species, of which twenty-nine are new.—4. Only differing from 3 in the tarsi, in which the last joint is as long as the two preceding: *Cl. intricatus*, new species from Van Diemen's Land.—5. Eyes distant, on the top of the head, a little emarginated beneath, terminal joints of the labial-palpi transversely hatchet-shaped, claws simple, the form of body resembling *Opilus*: *Cl. 4-maculatus*, F., *abdominalis*, Germ., *indicus*, F., from the Cape, *marmoratus*, Dej. (*Not. chinensis*, F.), *ibid.*, and *Cl. mitis*, new species, from the Cape.—6. (*Thaneroclerus*, Lefv.) Eyes distant, on the top of the head, emarginated beneath, terminal joint of the labial-palpi slightly hatchet-shaped, claws simple, last tarsal joint as long as all the others: *sanguineus*, Say, *Buquetii*, Lefv., and one new species, *dermestoides*, from Arabia Felix.—7. (*Pezoporus*, Kl.) Wingless, and with simple claws, in other respects like 3, only differing by the head being large, and the anterior angles of the elytra not projecting: *coarctatus*, new species from the Cape.—8. (*Lemidia*, Spin.) Eyes not emarginated, strongly projecting, antennæ eleven-jointed, with dilated terminal joints, claws simple: *nitens* (*Hydnocera nitens*, Newm.).—9. (*Hydnocera*, Newm., *Phyllobæmus*, Dej.) Eyes not emarginated, projecting, wide apart, antennæ very short, ten-jointed, with a button-shaped terminal joint, labrum not emarginated: *a*. Claws dentated: *humeralis*, Say, and six new species: *basalis* from Columbia, *attenuatus*, *lividus* from Brazil, *brachypterus*, *suturalis* from North America, *tenellus* from Mexico. *b*. Claws simple: *steniformis*, new species from Brazil.—10. (*Evenus*, Lap.) Like 9, but the body elongated, the labial-palpi very long, with

an oblong and slightly hatchet-shaped terminal joint, the hind legs long, the hind tarsi, at least the first three joints, without membranous appendages: *E. filiformis*, Lap., from Madagascar.

V. *Ptychopterus*. (This name cannot be a good one, on account of the dipterous genus *Ptychoptera*. In the first plan of this work, which was contained in the "Monatsberichten der Acad." of 1837, the genus was named *Placocerus*, and it is only by mistake that this name has not been retained.) Labial-palpi long, with a triangular terminal joint; antennæ broad and flatly compressed from the third joint, short, broadest in the middle: *P. dimidiatus*, the only species, from Cafferland.

VI. *Axina*, Kirby: containing a single species, *analis*, Kirby, not different, perhaps, from the *rufitarsis*, Perty.

In the following genera the first tarsal joint is so much shortened that the tarsi are apparently four-jointed.

VII. *Opilus* (*Notoxus*, F.)—1. Maxillary-palpi filiform, appendage of the tarsal joints undivided: *O. porcatus*, F.

In all the following, the terminal joint of the maxillary-palpi is hatchet-shaped.—2. Antennæ proportionally thin; appendage of the tarsal joints lobed: *O. mollis*, L., *domesticus*, St., *pallidus*, Ol., *univittatus*, Ross. (*fasciatus*, Steph.), and six new species, *tenuatus* from Ragusa, *thoracicus* from Macedonia, *frontalis* from Constantinople, *tropicus* from Sennaar, *cinctus* from Senegal, *obscurus* from the Cape.—3. Like 2, but the terminal joint of the antennæ double the length of the preceding: *interruptus* from Senegal, *basalis* from Sinai.—4. Like the preceding, but the ninth and tenth antennal joints turbinate, the eleventh almost as long as all the rest together: *suberosus* from Madagascar.—5. The last three antennal joints dilated; in other respects like the preceding. *a.* Body of the more common oblong form: *tristis*, and *callosus* from Madagascar, *patricius* from Van Diemen's Land. *b.* (*Platyclusus*, Spin.) Body broad and flat: *planatus* (*Clerus pl.*, Lap.).—6. (*Trogodendron*, Guér.) Antennæ thickened towards the tips, appendage of the tarsal joints undivided: *fasciculatus* (*Cl. fasc.*, Schreib.)

VIII. *Erymanthus*, Kl., Spin.; agreeing with *Trichodes* in the antennæ and palpi, habit rather that of *Opilus*, thighs all thickened, tibiæ curved, tongue deeply and sharply emarginated, terminal joints of the labial-palpi cup-shaped: *E. gemmatus*, from the Cape.

IX. *Trichodes*. The typical *Trichodes* have distinctly club-shaped antennæ. There are seventeen species (a great number of which are nominal). *T. nobilis* from Constantinople, and *aulicus* from the Cape, are new. A small group peculiar to New Holland, with the antennæ only a little thickened at the point, forms the genus *Zenithicola*, Spin., with *Tr. australis*, Boisd., *instabilis*, Newm., and one new species, *Tr. ochropus*.

In the following genera the tarsi are apparently four jointed, as the fourth joint is rudimentary and concealed in the emargination of the third.

X. *Corynetes*.—1. (*Corynetes*, Steph.) Terminal joints of the palpi almost hatchet-shaped, the joints of the club of the antennæ do not lock together: *C. cæruleus* (Cler. cærul., De Geer), *ruficornis*, St., and the following new ones, *pusillus* from Sardinia, *geniculatus* from Portugal and Andalusia, *analis* and *pectoralis* from Cafferland.

In the following, the terminal joint of the palpi is almost acuminate:—2. (*Corynetes*, Hbt. *Necrobia*, Steph.) Club of antennæ broad, with a large and almost quadrangular terminal joint: *C. violaceus*, *rufipes*, *ruficollis*.—3. The joints of the club of antennæ of equal size locking to each other: *C. scutellaris*, Ill., *bicolor*, Lap., *collaris*, Sch., *defunctorum*, Waltl., and two new species: *C. rubricollis* and *ater*, from the Cape.—4. Joints of the club of antennæ separate: *C. discolor* and *pallipes*, new species from Mexico.—5. (*Notostenus*, Dej.) Antennæ gradually thickened towards the point, body flat, linear: *C. viridis* (*Anob. vir.*, Thunb.) and *Thunbergii* (*Anob. cæruleum*, Thunb.)

XI. *Cylistus*, Kl.; palpi filiform, antennæ strongly pectinated from the fourth joint, claws broadly dentated below the point: *C. variabilis*, from the Cape, is a species varying in colour, with the habit of *Enoplium sanguinicolle*.

XII. *Enoplium*, Latr.—1. Palpi with a cylindrical terminal joint, claws broadly dentated below the point: *E. sanguinicolle*, *damicorne*, and three new species: *E. murinum* from St. Domingo, *velutinum* from Brazil, *lepidum* from Cuba.—2. Palpi with a hatchet-shaped terminal joint, tarsal joints of equal length: a. Claws simple: *E. serraticorne*, F., *pilosum*, Forst.; *marginatum*, Say; *viridipenne*, Kirby; *Kirbyi*, Gray; *trifasciatum* (Clerus), Laporte; *ramicorne* (*Chariessa ramicornis*, Perty); *vestitum* (*Brachymorpha vestit.*, Chevr.; *Corynet.*, *spectabilis*, Laporte); and ten new ones: *geniculatum* from Monte Video, *alcicorne*, *posticum*, *rufipes*, *ornatum*, *decorum*, *fasciculatum*, *scoparium*, *leucophæum* from Brazil; *fugax* from Columbia. b. Claws dentated: a. Antennæ eleven jointed: *testaceum* and *hirtulum* from Brazil; b. Antennæ ten jointed: *4-punctatum*, Say; and five new ones: *6-notatum*, *12-punctatum* from Brazil; *contaminatum*, *pilosum* from Columbia; *crinitum* from St. John's (West Indies).—3. (*Epiphleus*, Dej.) All, or the labial-palpi alone, with pointed terminal joints, antennæ very short, eyes large, emarginated internally, first joint of the hinder tarsi elongated, claws dentated at the base: eight new species from Brazil; and one, *distrophum* from North America.—4. (*Platynoptera*, Chevr.) Palpi short, with a strong hatchet-shaped terminal joint, antennæ strongly compressed, the first seven joints extremely short and close together, elytra posteriorly strongly dilated: *lyciforme*, Chevr., and one new species, *E. ampliatus*, from Brazil.—5. (*Ichnea*, Lap.) Terminal joints of the palpi almost acuminate, antennæ broadly flattened, ten jointed, the six before the three terminal of unequal breadth, elytra not dilated: *lycoides*, Lap.,

and seven new species: *melanurum*, *præustum*, *marginellum*, *laterale*, *suturale*, from Brazil; *opacum* from Cayenne and Surinam; *aterrimum* from Mexico.

In all 219 species, contained in the Berlin collection, have been minutely examined, and thirty-two of the more distinct figured at the end of the treatise; fifty-nine doubtful species, or only known by description, are mentioned.

Chevrolat has described a number of *Clerii* from South Africa (Rev. Zool. p. 276), which, for the most part, are not doubtful as species, although, perhaps, they do not generally belong to the genera to which he has assigned them with a query. Among seven species of *Notoxus*? the *N.* (?) *versicolor* is a *Tillus*, and certainly the same with *T.* (*Philocalus*) *succinctus*, Kl. (vide sup.) *N.* (?) *obsoletus* and *apicalis* are perhaps near the following, *N.* (?) *fasciatus*, which seems to agree with *T.* (*Cymatodera*) *obsoletus*, Kl.; *N.* (?) *virescens* and *latus*, with a broad round head, short rounded thorax, and flat elytra, are unknown to me; finally, *N.* (?) *marmoratus* is a *Clerus* (*Cl. marmoratus*, Kl.); and *N. sobrinus* perhaps is only a variety of the same. *Clerus*? *alternans*, and *Tillus*? *succinctus* are unknown to me, as well as the new genus *Micropterus* (*brevipennis*), which in habit must resemble an *Aptinus*. Nothing is said of the generic character, nor is the form of the antennæ given. *Dozocolletus oblongus*, is *Clerus* (*Pezoporus*) *coarctatus*, Kl., characterized as a new genus, with the habit of *Ctenostoma*.

Some new *Clerii*, from Port Philip, New Holland, have been described by Newman (Entomologist, p. 363). A new genus, *Xanthocerus*, corresponds to *Th. trogodendron*, Spin. (*Opilus*, p. Kl.) Besides the *Cl. fasciculatus*, Schreib., the author adds his *Cl. splendidus*, *simplex* and *pulcher*, and a new species, *X. idoneus*. *Pylus*, with a thick body, and a protuberance in the middle of the sides of the thorax, has likewise a new species, *P. bicinctus*. *Thanaximus accinctus*, *acerbus*, *confusus*; *Opilus congruus* (very like the *O. mollis*), and *Hydnocera confecta*, are also new. The most of these species are found on the flowers of the *Eucalyptus*. Newman (ibid. p. 402) has added another new species, *Pylus anthicides*.

PTINIORES.—Newman (Entomologist, p. 403) has described three new forms from Port Philip, in New South Wales, which he, probably incorrectly, ascribes to this family: *Synercticus*, with antennæ moniliform, and the terminal joint pointed, round eyes, heart-shaped thorax, broader convex elytra, short legs, heteromerous tarsi; *S. heteromerus*, taken on the flowers of the *Eucalyptus*. *Epiteles*, with large extended head, strongly crooked mandibles, long palpi, with the terminal joint somewhat thickened and truncate, kidney shaped eyes, short antennæ den-
tated from the fifth joint, narrow thorax of equal breadth, elytra scarcely covering the abdomen, short legs, swollen thighs, and "quasi"

five-jointed tarsi; *E. contumax*, taken from under the bark of the *Eucalyptus*. *Deretaphrus*, vid. under *Colydii*.

Xyletinus ornatus, Germar (Faun. Ins. Eur. 22, 2), black with a grey hairy coat, and the tip of the striped and pointed elytra red, is a new species from Hungary.

Ptinus exulans of the reporter, is from Van Diemen's Land (Arch. 1842, i. p. 147).

Imhof has enriched *Apat*e with three new species from Guinea (Verhandl. d. Naturf. Ges. zu Basel, v. p. 176): *A. producta*, *tonsa*, and *crinitarsis*. The reporter has added one from Van Diemen's Land, *A. collaris* (Arch. 1842, i. p. 148).

Harris (Ins. of Massachus. p. 52), has described two new North American species, *Lymexylon sericeum*, and *Hylecætus americanus*. He is in doubt if the former actually belongs to *Lymexylon*. In this I do not agree with him. A female, however, is alone known to me. On the other hand, in the *Hylecætus americanus*, the presence of a single red ocellus in the middle of the forehead, as in *Attagenus*, &c., is very striking, and appears to indicate that this beetle, which is not known to me from personal inspection, is incorrectly placed under *Hylecætus*. The reporter has also added a new species to this small group, *Lymexylon australe*, from Van Diemen's Land (Arch. 1842, i. p. 147).

SILPHALES.—In D'Orbigny's Voy. d. l'Amér., Blanchard has described the following new species of this family:—*Necrophorus didymus*, Brull., and *N. scrutator*, Bl., both from Bolivia; *Silpha apicalis*, Brull., from Potosi (Bolivia); *S. erythrura*, Blanch., from Monte Video; *S. discicollis*, Brull., from Bolivia; the last agrees with the *S. cayennensis*, Sturm. Cat. 1826, t. 2, f. 10, whilst the one preceding is identical with *S. hæmorrhoidalis*, St.

Agyrtes glaber (*Tritom. glabr.* Payk., Gyll., Zett.), from the north of Sweden, has been figured by Germar (Faun. Ins. Europ. 22, 1).

Catops australis of the reporter, is from Van Diemen's Land (Arch. 1842, i. p. 243).

Schiödte (Krøyer's Naturhist. Tidsskr. iv. p. 107) has corrected an error of Leon Dufour, who had represented *Silpha* as having an azygos secreting organ of the urinary bladder, consisting of a vessel, and a bladder voiding into the rectum. That bladder is the cæcum, and the vessel a vessel-like appendage to it, similar to the corresponding parts of *Dytiscus*.

PALPATOIRES.—Aubé (Ann. Soc. Ent. de Fr. xi. p. 233) has enriched the group of the *Scydmaenus thoracicus* with two new species: *Sc. laticollis*, from the Jura, is double the size; *Sc. minutissimus*, from the island of Louvier, is only half the size of *Sc. thoracicus*.

Scydmaenus antilotus, Helf., has been figured by Germar (Faun. Ins. Eur. 22, 3).

NITIDULARIÆ.—The reporter (Germ. Zeitsch. iv. p. 225) has attempted a systematic division of this family, and divided it into six groups, according to the number of the maxillary lobes, the proportions of the tarsal joints, &c.:—1st Group, *Cateretes*, with two narrow, long, maxillary lobes, and, as in the four following groups, very small fourth tarsal joint; it is divided into the genera *Cercus*, Latr. (*pedicularius*, &c., six species), and *Brachypterus*, Kug. (*gravidus*, *urticae*, &c., nine species), the former having simple claws, the second dentated; the latter differs, besides, by a small segment, which, in the male, is found at the point of the posterior part of the body, &c.

The following groups have a single maxillary lobe:—2d Group, *Carpophilini*, distinguished from the following group by strong shortened elytra, which leave two or three segments of the posterior part of the body free: *Mystrops* (three new species); *Colastus* (formerly *Colopterus*, Nit. *rupta*, F., eighteen species, all American); *Brachypeplus* (first described in these Archives, 1842, i. p. 148, four species, of which two are from Van Diemen's Land); *Cilleus*, Lap. (besides the species characterized by Lap. from Madagascar, a new one from Columbia); *Conotelus* (*Stenus conicus*, F.; eight species, all from America); *Carpophilus*, Leach (twenty-seven species); and *Ecnomæus* (with one new species from Senegal).—3d Group, *Nitidulinae*, forming the central point of the whole family; the genera are grouped according to the antennal furrows on the under side of the head; these are either converging in *Eपुरæa* (antennal furrows obsolete; *N. æstiva*, &c., thirty species), *Nitidula* (*bipustulata*, six species), *Perilopa* (two new species), *Soronia* (*N. punctatissima*, three species), *Prometopia* (*Nit. 6-maculata*, Say, two species), *Psilotus*, Fisch (*Nit. cornuta*, F., three species), *Platychora* (*Nit. Lebasii*, Dej., two species), *Axyra* (one new species from Guinea), *Ischæna* (two new species from Java); or the antennal furrows are straight and parallel, in *Ipidia* (*Ips. 4-notata*, F.); or they are behind the eyes, arched round externally in *Amphotis* (*Nit. marginata*, F.), *Lobiopa* (*Nit. undulata*, Say, ten species from America), *Omosita* (*N. colon*, three species), *Phenolia* (*Nit. grossa*, F.), *Stelidota*, (*N. strigosa*, Sch., seven species).—4th Group, *Strongylinæ*, differing from the preceding group, by the breast having projections; i. e., the pro-sternum juts out posteriorly; the posterior margin of the thorax is either locked to the anterior margin of the elytra, or it grasps strongly over them. To the first sub-division belong *Thalycra* (*Strong. sericeus*, St.; *N. fervida*, Gyll.), *Æthina* (one new species from Madagascar), *Pria*, Steph. (*Nit. dulcamarae*, Ill., four species), *Meligethes*, Steph., *Hebascus* (*Sphærid. anale*, F., four species), *Gaulodes* (one new species from New Holland), *Lordites* (four new species), *Pocadius* (*Nit. ferruginea*, F., five species). To the second sub-division belong *Camptodes* (*Sphærid. scutellatum*, Sturm., thirty-nine species, partly with dentated, partly

with simple claws, all American), *Cyllodes* (*Strong. ater*, Hbt., five species), *Cychramus*, Kug. (*Sphærid. luteum*, F., three species), *Amphicrossus* (*Nit. ciliata*, Ol. Enc., three species), *Pallodes* (*Strong. annulifer*, Hffg., Lap., four species), *Oxycnemus* (one new species from Brazil), *Triacanus* (*Nit. apicalis*, Er., in Meyens Reise); the last three genera are distinguished by elongated and narrow hinder tarsi.—5th Group, *Ipinæ*, differing from the *Nitidulinæ* by the concealed labrum; containing three genera: *Cryptarcha*, Shuck. (*N. strigata*, F., ten species), *Ips* (nine species), and *Rhizophagus*, Hbt. (one new species from North America). So far, with the exception of the genera *Meligethes* and *Rhizophagus*, the species of the Berlin collection are quoted, and the new ones described (exclusive of those of Madagascar, in consequence of Klug's labours at the fauna of that island):—The 6th Group, *Trogositinæ*, is only slightly mentioned; it differs from the former in the formation of the tarsi, in which the first joint is the shortest, and often scarcely observable. According to the general opinion, a single maxillary lobe only has also been ascribed to this group; but later investigation has convinced me, that the inner one, which, in groups 2-5, is alone present, is here so far back, and connected with the outer, that it is usually scarcely to be observed. I shall attempt soon to fix the genera of this group; but have here to remark, that the *Peltides* (*Peltis* and *Thymalus*, but not *Colobicus*) still belong to the family of the *Nitidulariæ*, but stand so near to the *Trogositinæ*, that they can hardly be separated from them as a peculiar group.

Blanchard has described a pretty considerable number of new species of *Nitidulariæ*, in D'Orbigny's Voy. d. l'Amer. Mer; but which, for the most part, remain doubtful, on account of their undefined generic marks, and insufficient descriptions, in which the most essential characteristics are passed over; on which account, I can only mention the species by name, without venturing to express an opinion to which of the genera, recognized by me, they belong: *Ips. ebenina*, Bl., from Bolivia; *Nitidula villosa*, Bl., ibid.; *N. nigro-maculata*, Bl., ib. (probably a *Lobiopa*, but it is impossible to fix the species); *N. lata*, Bl., ib.; *N. brevipennis*, from Peru; *N. pallens*, Bl., from Corrientes; *Strongylus M-rubrum*, Brull., from Bolivia (a beautiful *Camptodes*, allied to my *C. phaleratus*); *Str. tristis*, Lap., from Brazil (is *Camptod. scutellatus*, *Sphærid. scutell.*, Sturm.); *Str. nigrinus*, Lap., from Monte Video (appears identical with my *Campt. melanarius*); *Str. humeralis*, Brull., from Corrientes (a better defined *Camptodes*); *Str. thoracicus*, Lap., from Chiquitos, in Bolivia (doubtful); *Str. melanurus*, Bl., in Bolivia, caught on the mimosa and other flowers (doubtful); *Str. villosus*, Bl., from Moxos in Bolivia (apparently a *Pocadius*).

HISTERES.—Aubé has described three new European species of *Abræus* (Ann. d. l. Soc. Ent. d. Fr. xi. p. 231); *A. atomarius*, caught

once at Fontainebleau, and *A. punctum*, from Italy, resemble the *A. nigricornis*; *A. parvulus*, found at Fontainebleau, in a decayed oak, is very similar to my *A. granulum*, and differs only in the elytra being much closer punctured.

In D'Orbigny's Voy. d. l'Am. Mer, this family has been increased by Blanchard with a number of new species: *Hololepta attenuata*, from Bolivia; *Saprinus ornatus* (this name has already been given by the reporter to the *S. interruptus*, Fisch.), allied to the *S. decoratus* of the reporter, and *S. patagonicus*, both abundant in Patagonia; *S. nigrita*, from Maldonado and Monte Video; *S. erythropus*, from Buenos Ayres; *S. picus* (this name also is not free, as *Hist. picus*, Payk., is a *Saprinus*), from Corrientes; *S. impressifrons*, from Bolivia; *S. atro-nitidus*, from Corrientes. *Saprinus incisus*, of the reporter, from Van Diemen's Land, is also to be mentioned (Arch. 1842, i. p. 152).

DERMESTINI.—A new species, *Megatoma adspersa*, has been found by D'Orbigny abundantly in Bolivia, in houses and walls; and has been described by Blanchard, in the Voy. d. l'Am. Mer.

Megatoma morio and *Trogoderma rignum* of the reporter, are two new species from Van Diemen's Land (Arch. 1842, i. p. 152).

BYRRHII.—This family has been treated of by Steffahn in an excellent dissertation, "Tentamen Monographiæ Byrrhorum" (also printed in Germar's Zeitschr. f. d. Entomol., iv. p. 1). The difficult and hitherto much mixed species are firmly established. The genus *Byrrhus* is, following Stephens' arrangement, confined to such as have the antennæ gradually thickened; and also show some variations in the form of the terminal joint of the maxillary palpi, the shape of the lobes of the labium, the toothing of the mandibles, and in the presence or absence of a membranous appendage on the under side of the third tarsal joint, which are used for the certain distinction of the species. *B. scabripennis*, approximating to the *B. gigas*, from the Styrian Alps; *B. regalis*, Dahl., from the Banat; *B. insignis*, near to the *B. murinus*, from Turkey; *B. decorus*, allied to the *B. lariensis*, Heer, from the Banat; and *B. scutellaris*, Esch., from Kamtschatka, are new. The *B. striatus* of this author is the same with *B. glabratus*, Heer. The genus *Syncalypta*, Dillw., with a three-jointed club of antennæ, contains *B. setiger*, Ill.; *B. arenarius* and *pusillus*, St.; and a third new species, *S. striatopunctata*, Dej., from Spain. *Pedilophorus*, a new genus, with a five-jointed club of antennæ, broad tibiæ, and the third tarsal joint with an appendage, is founded on *B. auratus*, Duft. (*nitens*, Germ.) *Simpliocaria*, Marsh., with a five-jointed club of antennæ, narrow tibiæ, simple tarsi, embraces *B. semistriatus*, F., and *picipes*, Ol. I have also found that *Amphicyrta*, Esch., which Dejean places between the *Chrysomelæ* and *Colaspæ*, belongs to this family. It has filiform antennæ, the third tarsal joint has a membranous appendage, and narrow tibiæ with im-

perfect tarsal grooves; the known species are, *A. dentipes*, Esch., from California; and *A. chrysomelina* from the west of the Rocky Mountains in North America.

Microchaetes scoparius and *Limnichus australis* of the reporter, are two new species of this family from Van Diemen's Land (Arch. 1842, i. p. 153).

MACRODACTYLI.—*Parnus longipes*, Redtenbacher (Col. Austr. p. 14, n. 12), from the brooks of Austria, is the same with *P. substriatus*, Müll., *Dumerilii*, Latr.

Blanchard has described two new species in D'Orbigny's Voy. d. l'Amer. Mer., *Parnus pubescens* and *Potamophilus cinereus*, Bl., of the size of *P. acuminatus*, both from Corrientes.

HETEROCERIDÆ.—Kiesenwetter has published an excellent work on *Heterocerus* (Germ. Zeitschr. iv. p. 194, t. 3). The species of this genus closely resemble each other, so that hitherto there have been no fundamental distinctions; but a minute examination has brought to light a surprisingly rich collection of them. The author describes twenty species examined by himself, and thirteen of these are certainly native to Germany. Among these,—*H. parallelus*, Gebl., and *H. femoralis*, inhabit salt districts; *H. fossor*, *marginatus*, F., *hispidulus* (*marginatus*, Pz.), *obsoletus*, Curt., *levigatus*, Panz., *obliteratus*, *fuscus*, are pretty widely distributed; *H. intermedius*, at Berlin and Stettin; *sericans*, in Saxon Switzerland and Austria (also Italy); *pulchellus* at Leipsic; *murinus*, found by Dr. Rosenhauer at Augsburg; *H. minutus*, Dej., is from the south of France; *H. flavidus* from Italy (*Scarab. fl.* Rossi); *H. euphraticus* and *minimus*, have been collected in Mesopotamia; *H. limbatus*, Kn., from North America; *H. varius* and *lituratus*, from St. Thomas in the West Indies. The following species have only become known to the author by description: *H. dubius*, F., from the East Indies; *H. pallidus* and *pusillus*, Say, from North America; *H. hamifer* and *nanus*, Gené, from Sardinia; in all twenty-five species, of which two-fifths are new.

HYDROPHILIDÆ.—Robert (Ann. Sc. Nat. xviii. p. 378) has proved that *Hydrophilus piceus*, even in the state of a perfect beetle, does not feed on water plants but on water snails (*Limnæus*).

A new German species, *Hydrena dentipes*, Märk., discovered by Märkel at Pirna, has been described and figured by Germar (Faun. Ins. Europ. xxii. 5). *Hydrobius marginicollis* and *assimilis*, Hope, from Port Essington (Proceed. Ent. Soc. p. 48); and *Cercyon dorsale* of the reporter, from Van Diemen's Land (Arch. 1842, i. p. 153), are new New Holland species.

The description of the *Hydrophili*, for D'Orbigny's voyage, begun by Brullé, has been finished by Blanchard (vide Jahresb. f. 1838, p. 314). The following are described in the new number: *Hydrophilus*

(*Tropisternus*) *dorsalis*, Br., from Brazil; *H. Tr. lepidus*, Br., from the Paraná in Entre Rios; also *H. (Philydrus) pallipes*, Br., from Monte Video; *H. Ph. striatus*, Br., from Corrientes; *H. Ph. gibbus*, Br., in the Paraná behind Corrientes; *H. Ph. femoratus*, Br., from Corrientes; *Herorus pallipes*, Br., in the Paraná in Corrientes; *B. alternans*, in the Rio Negro.

LAMELLICORNES.—Mulsant has published an important work on this family; "Histoire Naturelle des Coléoptères de France, Lamellicornes, Paris, 1842." Much praise is due to him for his extension of the nomenclature, and the attention he has bestowed on the natural history of these insects, especially in their earlier states. We have descriptions and figures of the larvæ of *Onthophagus vacca*, *Aphodius pecari*, *Valgus hemipterus*, *Dorcus parallelipedus*, *Æsalus scarabæoides*, and *Sinodendron cylindricum*. The division, in general, is pretty much the same as that of Latreille; the *Lamellicornes* are separated into the naturally very different *Petalocerides* and *Priocerides*, the former into the groups of the *Copridæ*, *Aphodidæ*, *Trogidæ*, *Geotrupinæ*, *Oryctesinæ*, *Callicnemidæ*, *Melolonthinæ*, and *Cetoniæ*, all very correctly determined; but the group of the *Callicnemidæ* cannot be maintainable, since, of the two genera which compose it, *Callicnemis* and *Pachypus*, the former appears to me to belong to the preceding, the latter to the following group. In the farther division, Mulsant has much that is new and peculiar, so that we must often recur to this work. As, however, in his systematic researches, he has confined himself to the French Fauna, a great part of his divisions will require a wider foundation. Every variety should not be granted a peculiar name, for where, then, would be the limit of nomenclature?

Leon Dufour (Ann. d. Sc. Nat. xviii. p. 162, t. 4, 5) has made a comparison of the larvæ of *Cetonia aurata*, and *Dorcus parallelipedus*, according to their external as well as internal structure, and has come to the conclusion that the *Scarabæidæ* and *Lucanidæ* may be divided into two families. In the former, the abdominal plexus of the nervous system is composed of a mass of ganglions soldered together; in the latter, of a chain of knots proceeding from each other. The alimentary canal in the former has three collars of blind bags, a large lateral cæcum, and the gall vessels ending in numerous windings, closely applied to each other; in the latter, the canal has a single collar of rudimentary blind bags, a cæcum not lateral, and simple gall-vessels.

He also brings forward many external differences, but which are not comprehensive, as they only refer to the *C. aurata*. It is to be desired, that anatomical researches were multiplied. He is not acquainted with De Haan's important work on this subject.

Reiche (Ann. d. l. Soc. Ent. d. Fr. xi. p. 59) has commenced a correct description of the *Coprophagi*, beginning with the *Ateuchidæ*

and the apterous division. The genera with tarsi on the fore-legs are : *Aulacium*, Dej. (*Mintophilus*, Lap.), including the only known New Holland species, *A. carinatum*, Reiche (*Aul. Hollandia*, Dej.); *Copræcus*, Reiche, differing from the preceding by the simple rounded posterior angles of the thorax, is not yet sufficiently defined, as the specimen of the *C. hemisphericus*, Péron (from New Holland), in the Paris collection, according to Latreille and Guérin, wants the antennæ and parts of the mouth; *Tessarodon*, Hope (*At. hollandia*, F.), only known to the author from Hope's plate, and placed here conjecturally. In the others, the anterior tarsi are wanting: *Circellium*, Latr. (*A. Bacchus*, F.); *Eucranium*, Dej.; *Glyphiderus*, Westw., which has two — *Pachysoma* and *Mnematum*, MacL., having a single spine on the intermediate tibiæ.

Westwood (Proceed. Ent. Soc. p. 51) has made known two new New Holland genera of *Ateuchidæ*. *Cephalodesmus*; clypeus in medio 4-dentatus, dentibus intermediis valde elongatis, prothorax magnus 8-angularis, pedes valde elongati, tarsi antici distincti, breves: *C. armiger*. *Temnoplectron*; clypeus in lobos duos minutos obtusos productus, prothorax lateribus rotundatis (et cum elytris subcontinuis) antice parum angustior; tarsi antici minuti; unguës subtus denticulo instructi: *T. rotundum*, from Melville Island. To the genus *Tessarodon* (*At. Hollandia*, F.), he adds two species, *T. angulatus* from Swan River; and *T. piceus* from Port Essington; the latter is also described by Hope (Proceed. Ent. Soc. p. 44).

Westwood has also (Proceed. Ent. Soc. p. 58), pointed out some new genera of the same family: *Arachnodes* and *Nanos*, however, alone, belong to the *Ateuchidæ*, both formed at the expense of *Epilissus*, Dej.; the former (*Circ. nitidum*, Lap.), with the mentum not emarginated, slender labial-palpi, sides of the prothorax angular and reflexed; long legs, and the last tarsal joint running out to a small spine; *Nanos* (*Circ. pygmaeum*, Lap.), mentum strongly emarginated, labial-palpi very short and thick, sides of the prothorax rounded, shorter legs, and crooked tibiæ.

The following belong to the real *Copridæ*, having tibiæ broader towards the end, and the tarsal joints of the hind legs gradually narrower: *Macroderes*, almost hemispherical, with emarginated clypeus, very large prothorax rounded at the sides: the type is *Onthophagus Greenii*, Kirby; *Uroxys*, oblong, somewhat flat, clypeus sharply 2-lobed anteriorly, sides of prothorax angular in the middle, elytra pointed posteriorly, elongated fore-legs, and (in the one sex) tibiæ angular internally; *U. cuprescens* from Columbia.

Westwood has mistaken the genus *Scatonomus* of the reporter; both the species mentioned by him, *Sc. myrmidon* (*Onth. myrmidon*, Lacord.) from Cayenne, and *Sc. smaragdinus* from Brazil, belong to *Onthocharis*, Dej., from which *Scatonomus* is essentially very different. *Anomiopus*, with two new Brazilian species, *A. virescens* and *nigricans*;

is distinguished with difficulty from *Onthocharis*, by the very broad hind legs; at least, in the Berlin collection, I have a series of species before me, in which a gradual transition is found in the hinder tarsi, from the broadest form, as in the *Anomiopus*, to the narrower, as existing in the *O. myrmidon*.

The genus *Bubas*, Meg., has been distinguished from *Onitis*, by Mulsant (Col. Fr. p. 76), from having no scutellum, nor any free space in place of it; the first joint of the labial-palpi not smaller than the second, the body tolerably convex, and the prothorax forming projections anteriorly; the species are *O. bison*, F., and *bubalus*, Ol.

Hope has described some new species of *Coprinæ* from Western Africa (Ann. Nat. Hist. ix. p. 494): *Gymnopleurus hilaris*, *latus*, and *Heliocopris Dianeæ*.

The New Holland Fauna has been enriched with eleven species of *Onthophagus*, five from Port Essington by Hope (Proceed. Ent. Soc. p. 43), and six from Van Diemen's Land* by the reporter (Arch. 1842, i. p. 154).

The presence of the genus *Copris* in New Holland, appears to be confined to the north coast. Hope (Proceed. Ent. Soc. p. 44) describes a species, *C. glabricollis*, from Port Essington, and mentions that he is in possession of three other species from Melville Island.

The *Aphodiidæ* have been divided by Mulsant (Col. Fr. p. 160, &c.) into two divisions, and the number of genera increased. The first division, *Aphodiarii*, with narrow hinder tarsi, and distinct claws upon them, is separated into three sub-divisions:—1. *Aphodiatæ*, has normally the striæ on the elytra with simple interstices, the head flat or slightly convex, half-six-angled or semicircular, and then slightly emarginated anteriorly; well developed membranous maxillary lobes. 1. *Colobopteris*; elytra truncate, not completely covering the pygidium; *A. erraticus*. The following genera (2–6) have the clypeus laterally dilated before the eyes. 2. *Coprimorphus*; first joint of the hind tarsus as long as the four following put together; *A. scrutator*. 3. *Eupleurus*; scutellum long, back of the elytra flat; *A. subterraneus*. 4. *Otophorus*; scutellum long, back of the elytra convex, dilatation of the sides of the clypeus forming a right angle; *A. hæmorrhoidalis*. 5. *Teuchestes*; like 4, only the dilatation of the sides of the clypeus is rounded; *A. fossor*. 6. *Aphodius*; scutellum short; *A. scrybularius*, *conjugatus*, *fætens*, *finetarius*, *rubens*, Dej.; *alpicola*, new species, from Savoy; *vernus*, new species, from the South of France; *ater*, *granarius*, *bimaculatus*, *plagiatus*, *4-maculatus*, *tristis*, *exiguus*, new species; *pusillus*, Hbt.; *monticola*, Dej., new species; *hydrocharis*, F.; *sordidus*, F.; *lugens*, Cr.; *immundus*, Cr.; *nitidulus*, F.; *merdarius*, F.; *ferrugineus*, Dej.,

* One of these has been called *O. hirculus*, a name under which a species, abundant in Brazil, has been described by Mannerheim, and which must therefore be altered.

new species; *lividus*, Ol.; *lineolatus*, Ill.; *melanostictus*, Schüpp., Schm.; *inquinatus*, F.; *pictus*, St.; *tessulatus*, Cr.; *sticticus*, Pz.; *consputus*, Cr.; *4-guttatus*, Hbt.; *sericatus*, Zgl.; *obscurus*, F.; *porcus*, F. In the two following genera (7 and 8) the elypeus is little if at all dilated laterally. 7. *Acrossus*; clypeus semicircular, posterior border of the prothorax, at least in the middle, not marginated; *A. discus*, Jur.; *rufipes*, L.; *luridus*, F.; *depressus*, Kug.; *Pecari*, F. 8. *Melinopterus*; clypeus semi-hexagonal; *A. prodromus*, Brahm.; *obliteratus*, Heyd.; *contaminatus*, Hbt. 9. *Trichonotus*; differing from the preceding by the hairy prothorax; *A. scrophæ*, F. 10. *Heptaulacus*, has seven furrows on the elytra, with rib-like interstices; *A. sus*, F.; *nivalis* (*sus*, var., Gyll.), and *tetudinaris*, F.—Second sub-division: *Ammæciatæ*; head strongly arched, clypeus semicircular deeply emarginated, the maxillary lobes short and fringed. A single genus: 11. *Ammæcius*; *A. elevatus*, F.—Third sub-division: *Pleurophoratæ*; ten rib-like interstices of the striæ on the elytra, the sixth and eighth shorter than the seventh. 12. *Plagiogonus*; elytra truncate obliquely to the suture; *A. arenarius*, Ill. 13. *Oxyomus*; head simply dotted; *A. porcatus*, F. The following have the head covered with elevated granulations. 14. *Platytomus*; prothorax fringed, and without transverse furrows, first joint of the hinder tarsi dilated triangularly; *P. sabulosus*, Dej., rare in the South of France. 15. *Pleurophorus*; prothorax as in the preceding, first joint of the hinder tarsi narrow and of equal breadth; *A. cæsus*, Panz. 16. *Rhyssenus*; prothorax fringed with short bristles on the sides, the back transversely furrowed; *A. porcatus*, F.; *verrucosus*, new species, from Marseilles.—The second division, *Psammodiarii*, has the hind legs thickened, the hind tarsi with gradually smaller joints and indistinct claws. 17. *Diastictus*; prothorax without fringes and cross furrows; *A. sabuleti*, Payk. 18. *Psammodius*; prothorax with cross furrows, and set with short little bristles on the sides; *A. sulcicollis* and *porcicollis*, Ill.

There is certainly much good in this arrangement, though the characters usually employed are preferable, and the marks of the genera are often very minute and undefined. An examination of the extra European species will establish some of them and alter others, and especially give the proper rounding to the divisions. The *Ammæciatæ* will then assume a less subordinate rank in richness of species. The genera *Coprimorphus* and *Eupleurus* cannot be separated; but *Colobopteris* and *Teuchestes*, as well as *Acrossus*, appear very natural groups of species. Heer has shown, that *Diastictus* (*sabuleti*) is the proper *Psammodius*, Gyll., and does not belong to the *Aphodiidae*, but the *Trogidae*. (V. Jahresb. f. 1841, p. 225).

Aphodius Zenkeri, Germar, has been figured in his Fauna Ins. Eur. 22, 6.

Aphodius erosus of the reporter is a new species from Van Diemen's Land (Arch. 1842, i. p. 157):

To the *Trogidae* the reporter has had the *Trox australasiae*, Latr., from Van Diemen's Land (ibid. p. 158).

Germar has written an excellent monograph on the spherical *Trogidae* (Zeitschr. iv. p. 109, t. 1). They form four genera; some are completely spherical (the posterior angle of the prothorax quite rounded): *Sphæromorphus*, with ten-jointed antennæ, broad flat tibiæ, long and thin tarsi, contains fifteen species from different parts of America, hitherto all undescribed; *Synarmostes*, with nine-jointed antennæ, broad flat tibiæ, short tarsi: containing two species from Madagascar, *Acanthoc. tibialis*, Kl., and *scabrosus*, Laporte. In the others, the sphere is incomplete (the prothorax has blunt angled posterior corners): *Clæotus* has nine-jointed antennæ, triangular tibiæ, short tarsi; two new species from Columbia. Lastly, *Acanthocerus*, MacLeay, with ten-jointed antennæ, triangular tibiæ, pretty long tarsi; nineteen species, of which seven have already been described in different places, and one (*aphodioides*) even under four names. Thus thirty-eight species are known; of these, two are from Madagascar, the others belong exclusively to America; for *A. senegalensis*, Lap., owes its name to an error in its locality, which is Cayenne, so that Dejean's name of *A. striatus* should be employed.

Mulsant has enriched the *Geotrupidae* with one new genus, *Thorectes* (Col. Fr. p. 367), which differs from *Geotrupes* by the soldered elytra, rudimentary wings, and the club of the antennæ, in which, when it is folded up, the middle fold is not concealed; *G. levigatus*, F. The name is synonymous with *Thorictus*, Germ. I cannot convince myself of the utility of this genus, and would rather consider it, as well as *Ceratomyus*, as a sub-genus of *Geotrupes*.

Mulsant has enriched *Bolbocerus* (ibid. p. 350, t. 1, f. 15, 16) with a distinct new European species, *B. gallicus*. It has much similarity to *B. Æneas*, but the upper side is glossy black, the scutellum not dotted; different from the North African *B. bocchus*, by the simple conical head-horn of the male, &c. Many New Holland species of this genus have become known, principally belonging to the north and west sides. Bainbridge (Trans. Ent. Soc. of Lond. iii. p. 79) has described a series of them: *B. Kirbyi*, *latus* (same with *B. frontalis*, Guér. Voy. de le Favorite, both females), *serricollis*, *hastifer* (same with *Athyreus recticornis*, Guér., ibid., but really a *Bolbocerus*), *7-tuberculatus*, *fissicornis*, *trituberculatus*. The first species is from Melville Island, the rest from Swan River. Hope (Proceed. Ent. Soc. p. 43) also describes *B. Kirbyi*, from Port Essington, besides three new species, *B. neglectus*, *rotundatus*, both females; *B. rubescens*. The two latter are amongst the smallest species. The reporter (Arch. 1842, i. p. 105) has shown, that the genus *Elephastomus*, MacL., is untenable, as *E. proboscideus* is only

an aberrant male of *Bolbocerus*, and certainly *B. australasiae*, Kirby, is the female, upon which, also, the genus *Bolbocerus* is founded.

The reporter has increased the group of *Dynastidae* with one new genus, *Pimelopus*, which has, in common with *Cheiroplatys*, Hope, the hind legs strongly thickened, with leaf-like terminal spines, &c., but is distinguished by its three-toothed anterior tibiae, also three-toothed mandibles, five-toothed maxillae, and a body more swollen. One species, from Van Diemen's Land, *P. porcellus* (Arch. 1842, i. p. 159); also *Cheiroplatys mælius* of the reporter (ibid. p. 158).

Waterhouse has made known a Beetle of Valdivia as *Oryctomorphus* (?) *pictus* (Entomologist, p. 261), which Guérin has already described as *O. variegatus*. The author was only acquainted with the female, so that his opinions with regard to the definition of the genus are not well grounded,

In the group of *Rutelidae*, Guérin has characterized a new genus, *Barymorpha* (Delessert Voyage, ii. p. 40, t. 11, f. 2), which, in most points, agrees with *Parastasia*, but differs in the claws of the hind tarsi being equal and simple; *B. bimaculata*, the only species, is from the island of Penang, on the coast of Malacca. *Parastasia* has also been enriched by the same author with a new species from the same place, *P. obscura*; and Westwood has added another, *P. rufopicta*, from Sylhet (Proc. Ent. Soc. p. 55).

Harris (Ins. of Massachusetts, p. 23) mentions, that the *Pelidnota punctata* is often found, in great quantity, on the wild and cultivated vine, the leaves of which they gnaw, and do much harm to the fruit. They fly by day. The larva lives in decayed wood.

Mulsant has divided the *Melolonthidae* (Col. Fr. p. 405) into four groups, *Melolonthariae*, *Sericariae*, *Anomalariæ*, and *Hopliariæ*, the characters of which are only given in regard to the European ones, and taken from the claws alone; the author distinguishes the *Sericariae* from the *Melolonthariae*, by their claws being so cleft at the point, that the under tooth is broader and blunter than the upper. I have formerly remarked (Arch. 1 Jahrg. i. p. 261), that in this division the labrum is concealed, so that the anterior margin of the mentum lies immediately upon the clypeus; there are also some other characters which are found united in the European *Sericariae*, and which extra European genera have, individually, in common with them. The *Anomalariæ* are distinguished by simple, and, in general, remarkably unequal hind claws. This is always the case; but it does not distinguish them from the *Hopliariæ*, for which the author gives a single hind claw as a characteristic, as the greater number of the extra European, especially the numerous South African forms of this division, have two simple unequal claws like the *Anomalariæ*. The want of the terminal spines, on the hind legs, should rather characterize the *Hopliariæ*. The division

Sericaria here contains the genera *Serica* (*brunnea*), with double-toothed anterior tibiae, nine-jointed antennæ, with an elongated laminated club in the ♂, and somewhat truncated maxillary palpi; *Omalopecta* (*holosericea*, Scop., *variabilis*, F.), with double-toothed anterior tibiae, ten-jointed antennæ, pointed maxillary palpi; *Brachyphylla* (*ruricola*, F.), with double-toothed anterior tibiae, nine-jointed antennæ, and the hind margin of the clypeus depressed on each side, and, in consequence, having a projecting posterior angle; *Triodonta* (*Aquila*, Dej., Lap.), with triple-toothed anterior tibiae, indistinctly ten-jointed antennæ; and *Hymenoptia*, Esch., with triple-toothed tibiae, nine-jointed antennæ, and claws furnished beneath with a membranous border. Under the *Hopliaria* the author separates the *Hoplie* with ten-jointed antennæ, as a peculiar genus, *Decameria*, although the male alone distinctly possesses the ten-jointed antennæ and not the female.

Mulsant has described several new species: *Anoxia scutellaris*, Chev., from the South of France, resembling the *australis*, Sch.; *Rhizotrogus thoracicus*, Dej. (is *maculicollis*, Villa, Heer); *Rh. cicatricosus*, chiefly inhabiting the south, plentiful at Lyons; *Rh. marginipes*, Chev., also in the south, especially at Bordeaux; *Rh. vicinus*, Dej.; *Hymenoptia Chevrolatii*, in the south of France, at Lyons, upon *Festuca elatior*, different from the Portuguese *H. strigosa* (*Mel. strigosa*, Ill.)

Heer has published a valuable treatise, "Über geographische Verbreitung und periodisches Auftreten der Maikäfer." He here shows a three years' cycle of development. Rosenhauer also asserts, for the Erlangen district, a three years' period. Ratzeburg (*ibid.* p. 39) adduces his farther experience in favour of a four years' cycle.

Guérin (Rev. Zool. p. 6) has remarked, that several species of *Rhizotrogus*, of Algiers, are wingless; and, in consequence of this circumstance, have peculiar habits; he therefore proposes, that they should form a peculiar sub-genus, under the name of *Geotrogus*. There are four species cited, one of which is new; *Rh. Magagnoscii*, which must have a great similarity to the *Rh. dispar*, only the hind tarsi of the ♂ are thin, and scarcely longer than the tibiae, while, in the rest, they are a half longer; I do not know if this is the case in the other three species enumerated under *Geotrogus*; both sexes of *Rh. dispar*, Gory, will belong to this sub-genus (the same is also the case with the *Rh. Gabalus*, Buq., which is not mentioned); of *Rh. Gerardii* and *Amphytus* (not *Euphytus*), Buq.; the females only belong to it, the males being true winged *Rhizotrogi*.

Hope has mentioned some new species from Western Africa (Ann. Nat. Hist. ix. p. 495); *Popillia sulcipennis*, *luteipennis*, *cyanoptera*, *Lepidiota Savagei*, *Euchlora circumcincta*.

Anisoplia theicola, Waga (Ann. d. l. Soc. Ent. d. Fr. xi. p. 273, t. 11, f. 9), was found in a packet of Chinese tea.

The reporter has made some contributions to the knowledge of New Holland *Melolonthæ* (Arch. 1842, i. p. 166-170). The position of the genus *Cryptodus* (p. 106) I have left doubtful. I have since convinced myself, that this genus, in a wider sense, does belong to the *Melolonthæ*, and certainly to the division of the *Cyclocephalites*, Lap., where it approaches nearest to *Lampropus*, Lap., which is also to be reckoned in that group. The species from Van Diemen's Land, described by me (ibid. p. 160), *Cr. anthracinus*, is probably the same with *Cr. tasmanianus*, Westw. (Proceed. Ent. Soc. p. 34).

Several new genera have been characterized, of which *Silopa* (with eight species); *Nepytis* (one species); *Scitala* (two species), stand in the middle between the proper *Melolonthæ* and *Sericæ*, as they have, in common with the former, the distinct protruding labrum, and with the latter, the short blunt mandibles, and broad shield-like femora. They correspond, perhaps, partly to the genus *Sericestis*, Dej.; *Scitala* especially belongs to it; different forms, however, appear to be intermixed. The new genus *Telura* (one new species) is somewhat more aberrant, as its femora do not more than cover one segment of the abdomen. One *Liparetus* and one *Phyllotocus* (*Macrothops*) are also described.

Hope has characterized one new genus from Port Essington, *Phenognathus* (Proc. Ent. Soc. p. 45); "Pachypo affine, pedibus posticis longissimis, caput in medio cornutum, labrum porrectum, conicum, mandibulæ exsertæ, antennæ 9-articulatæ maxillæ lobis minutissimis, prothorax antice subretusus, elytra conica postico valde attenuata." One species, *Ph. Erichsonii*; 3''' long; doubtful, in my opinion. Also: *Sericesthis Gouldii*, not belonging to the genus characterized by me, but to a new one, which I have provisionally marked in the Berlin collection with the name of *Colpochila*; *Liparetra nigricollis*; and, lastly, *Mæchidius rufus*. Westwood has given the diagnoses of five new species of *Mæchidius* (comprehending the last), which I here mention by way of supplement (Proc. Ent. Soc. p. 40).

In the Ins. of Massachusetts, Harris has contributed some valuable information on North American *Melolonthidæ*. *Arcoda lanigera* is particularly injurious to pear trees, without, however, sparing others. It appears in May and June, and flies in the morning and evening. The genus *Phyllophaga*, Harris, takes a preponderating rank in North America (described in 1826, afterwards called *Ancylonycha*, by Dejean); *Ph. quercina*, appears in May and June, in masses, flying by night, chiefly destroying the leaves of the cherry trees. The larvæ eat the roots of grass, so that the turf can, in spots, be lifted up like a carpet; *Ph. fraterna*, Harr., somewhat smaller than the preceding, slenderer, the dots upon the prothorax and the elytra not so distinct, the three raised lines on the elytra scarcely to be perceived, otherwise like

the former; appears in June and July; less numerous, habits similar; *Ph. hirticula*, Kn., appears at same time; common. In other places, *Ph. georgicana* (*Mel. georg.*, Schönh.) appears in masses in May and June. *Melolontha variolosa*, Hentz. (this is the true *Mel. occidentalis*, L.), is found at some points of the coast, in multitudes but seldom universally. The nocturnal *Omaloplia vespertina* and *sericea* gnaw the leaves of the *Rosa rubiginosa*. *Anomala cælebs*, Germ., to which perhaps *Mel. varians* and *lucicola*, F., belong, is found in great quantity on the different species of Sumach, which it often entirely strips of leaves; and, since 1825, has begun to spread itself over the wild and cultivated vine. *Macroductylus subspinosus*, commonly called "rose-bug" in North America, appearing at the season of the rose-blossom, and generally upon roses, has in latter years very much increased, and extended itself to other plants, particularly the vine and fruit trees, and may be esteemed the worst of all *Melolonthide*, as it not only consumes the leaves, but also the blossoms and fruit. The development from the egg to the beetle takes place in it within a year.

The *Melitophilæ* have been treated of in Burmeister's "Handbuch der Entomologie, 3 Bd., Coleoptera Lamellicornia Melitophila."

Mulsant (Col. Fr. p. 519) divides the group *Cetoniide* into three subdivisions: *Valgarii*, *Trichiarii*, and *Cetoniarii*. The first differs from the others by the hind legs diverging from each other. The last subdivision is separated into three genera: *Cetonia*, with a knob-like dilated apophysis of the breast, the others with a simple one; *Oxythyrea* (*stictica*), tibiae double-toothed; *Tropinota* (*hirtella*, L., *hirta*, F.), with triple-toothed anterior tibiae. Under the last genus a new species, *Tr. Reyi*, is mentioned, which has hitherto generally been confounded with *Tr. hirtella*, and is minutely distinguished by the author: it had already been described by Charpentier (Hort. ent.) as *C. crinita*.

Westwood has contributed much to the knowledge of this group in his *Arcana Entomologica*; a peculiar treatise is devoted to the *Goliathide* of Asia (p. 113). He adds to the genus *Narycius*, as a sub-genus, *Cyphonocephalus*, which, at the first sight, especially in the form of the horns of the head, resembles *Dioronocephalus* (*Hardwickii*), but agrees with *Narycius* in the parts of the mouth, and differs by the simple anterior tibiae of the ♂. *N. (Cyphonoceph.) smaragdulus*, is a beautiful East Indian beetle. *Mycteristes*, with the sub-genus *Phædimus* and *Jumnos*, are next mentioned, from which *M. rhinophyllus* ♀, and *J. Roylii* ♂, are figured; the genus *Rhomborhina*, Hope, with nine species, is mentioned, of which *Rh. apicalis* from Nepal, *Rh. microcephala* from the Himalayah, *Rh. clypeata* from Japan, are new; and *Rh. japonica* and *hyacinthina*, Hope, are figured; a tenth, *Rh. pilipes*, only cursorily mentioned by name, is afterwards, p. 192, again introduced as a variety of *Rh. Mellii*. A new genus, *Anomalocera*, has been described by Hope,

and is here figured; the long antennal-clubs of the male, as well as the longer and narrower thoracic spines, distinguish it from the preceding genus. *A. Parrii* is from the Himalayah. *Trigonocephalus*, Hope, is represented as a peculiar genus, with four species; of these plates are given of *Tr. nepalensis* (*Hardwickii*), ♂, *Delessertii*, and a new one, *Tr. Saundersii*, from the East Indies; the fourth, *Tr. Cantori*, Hope, according to Westwood, does not differ from the first. Under the name *Heterorhina*, he comprehends those of which the males have not the fore-legs remarkably long. It is principally formed from *Gnathocera* and *Dicheros*, Gory. The different species, even those nearest allied, deviate in the characteristics of the sex and the form of the maxillary lobes, the latter vary also in different individuals of the same species, and even in one and the same individual; there belong to it of Asiatic species—for the genus is also common in Africa—*Gnathoc. nigritarsis*, *Hopei*, Gory; *dives*, Westw. (*MacLeayi*, Gory, *pretiosa*, MacL.); *MacLeayi*, Kirby (*pretiosa*, Esch.); *decora*, Ill. (*6-maculata*, F.); *amœna*, Hope; *punctatissima*, Westw. (*jucunda*, Hope); *tibialis*, Westw.; *glaberrima*, Westw., new East Indian species; *Bengalensis*, Hope (*melanaria*, Gory); *jucunda*, Germar (*smaragdina*, Gory); *elegans*, F.; *olivacea*, Guér.; *bimacula*, Wd. (*Wiedemanni*, MacLeay); *confusa*, Westw. (*limaculata*, Gory); *Cruera* (*Diceros cru.*, Newm.); *Childrenii*, new species from Bengal; *bicornis*, Latr. (*Dicher. plagiatus*, Gory); *ornata* (*Dich. orn.*, Hope); *biguttata*, Westw., new species from the Philippines; *decora* (*Dich. dec.*, Gory); *Petelii*, Buq.; which last scarcely differs from the preceding. These twenty-three species are, with few exceptions, figured with dissections.

Westwood has illustrated the *Goliathidæ* of Africa in a similar manner. At the top stand *Hypselogenia* and *Goliathus* with the three known species, *G. giganteus*, Lam., which he examined in the Glasgow collection; *Drurii*, Westw. (♀ *regius*, Kl.); and *Cacicus* (♀ *princeps*, Hope). Of *Mecynorhina*, Hope; *M. Polyphemus* ♀, and *torquata* ♂ and ♀, are represented in excellent plates. Under *Ceratorrhina* the author comprehends *Dicronorhina*, Hope; and *Eudicella*, White; the group *Dicronorhina* is composed of *micans*, Drury, which the author holds to be different from that found at Senegal, and to which, on this account, he gives a new name, *cavifrons*; *splendens*, MacLeay; and both sexes of a splendid new species, *C. derbyana*, Melly, from the interior of South Africa, are very beautifully figured. The second group, *Eudicella*, White, contains *Daphnis*, Buq.; *Smithii*, MacLeay; *Morgani*, Wh.; *frontalis*, Westw.; the two latter are figured; *Grallii*, Buq.; and one new species, *C. (Eud.) ignita*, Westw., from the Gold Coast. The third group, *Cheirolasia*, Westw., is a new form, where the anterior tibiæ of the male are unarmed either outwardly or inwardly; but on the fore-legs, on the inside, the tip of the thigh,

the base of the tibia, and the claw-joint, are covered with thick hairs; the colour is not metallic, the upper surface is ornamented with spots of felt: *C. Ch. Burkei* from South Africa. *Taurhina* (*Nireus*, Schaum); *Cælorrhina* (*4-maculata*, F., *aurata*, Westw.); and *Stephanorrhina*, Burm. (*guttata*, Ol.); form the three following groups. The next genus, *Tmesorrhina*, Westw., has the short thoracic apophysis in common with the preceding, but differs in the unarmed head of the male; *Tm. concolor*, new species from Sierra Leone, and *Iris*, F. (*amabilis*, Bainbr.) The new genus, *Aphelorrhina*, Westw., agrees with the preceding in the unarmed head, but differs in a long thoracic apophysis; *A. sinillima*, formerly figured as *Tmesorrh. s.*, is a new species from Sierra Leone. To these are added *Dymusia* (*cyanea*, Ol., and *punctata*, Sch.); *Bothrorrhina* (*reflexa* and *ochreata*, Gory); *Chordodera* (*5-lineata*, F., and *pentachordia*, Kl.); and *Plusiorrhina*, Burm.; (*depressa*, Gory, *cincta*, Voet., *plana*, Wd., *mediata*, Westw., new species from Cape Palmas; *abbreviata*, F.) The African species of *Heterorrhina* are:—*Africana*, Drury; *viridi-cyanea*, Pall., Beauv.; *monoceros*, Gory; *suturalis*, F.; *algoensis*, Melly, a new species from South Africa, of which the male, with two long horns, approaches the East Indian form of *Dicheros*; *flavipennis*, Westw., likewise new; also *Feisthamelii*, *chloris*, and *smaragdina*, Gory. Lastly, the new genus, *Anisorrhina*, Westw.; the different species exhibiting varied formation in the head; the thoracic apophysis conical, projecting; the tibiæ in the male all simple, in the female the anterior tibiæ three-toothed, the posterior with spines below the middle: the species are, *bimaculata*, Dej. (*flavomaculata*, F.); *umbonata*, Gory; *3-vittata*, Schaum; *bicolor*, Burm.; *natalensis*, Hope. The last three species are figured.

Another treatise of Westwood (ibid. p. 125, t. 32), represents several remarkable *Cetonia* of Madagascar: *Bothrorrhina reflexa*, *Schizorrhina Guérinii*, new species; and *plumigera* (*Ceton. plum.*, Gory); and *Chromoptilia diversipes*, Westw., a new genus, which, to the *Trichia*-like form of body, unites the hairy covering on the legs, similar to that of the preceding species.

The same author also figures (ibid. p. 103, t. 28) some remarkable new *Cetonia* of the East Indies and New Holland: *Schizorrhina obliquata*, from New Holland; *Sch. Bestii*, from Norfolk Island; *Macronota Mearesii*, from the Himalayah; *M. Rafflesiana*, from Sumatra; *M. tristis*, from Java; *M. vittigera*, from Mysore; lastly, he figures (ibid. p. 187, t. 48, f. 6), an African species of the genus *Inca*: *I. lineola*, Westw., from Sierra Leone.

There are also two new species from Western Africa, *Diplognatha admixta*, and *Cetonia cincticollis*, Hope. (Ann. Nat. Hist. ix. p. 494.)

In the voyage of Delessert, Guérin has given an etching of the head and parts of the mouth of the genus *Centhrognathus*; a beautiful plate

of *Gol. (Trigonophorous) Delessertii*; as well as copious descriptions of the *Cetoniae* collected by Delessert (*Gnathocera olivacea*, *Macronota picta*, *Cet. Malayana*, *Goryi*, *rufovittata*).

Saunders has characterized two new species from the north of India, *Cremastocheilus (Cænochilus) Campbellii*, and *C. brunneus*. (Proceed. Ent. Soc. p. 51.)

Among the *Lucanidae*, Mulsant has described (Col. Fr. p. 582) a genus, *Hexaphyllus*, which he had characterized (1838) in the Lyons "Ann. d. Sc. Phys. et Nat. publ. par la Soc. d'Agric.," but which has hitherto been little known; it differs from *Lucanus* only in the greater number of antennal plates, a characteristic which is not essential in *Lucanus*, and in which the species nearest allied show variation. The species, *H. Pontbrianti*, Muls., which was found once at Lyons, does not appear to me to be new, but identical with *L. barbarossa*, F.

Hope has characterized, as new, species of *Lucanus*, from Western Africa (Ann. Nat. Hist. ix. p. 494), *L. Savagei*, *picipennis*, *angulatus*.

Guérin has figured, in Delessert's Souv. (p. 48, t. 12, f. 3), under the name of *Lucanus Delessertii*, a variety of the *L. bicolor*, Ol., in which the yellow of the sides of the elytra gradually dilates posteriorly.

Dorcus Lessonii, Buquet, is a new Chilian species. (Ann. d. l. Soc. Ent. d. Fr. xi. p. 283, t. 12, 1.)

The species of the genus *Lamprima* have been catalogued by the reporter (Arch. 1842, i. p. 108). The males of one group have the single terminal horn of the anterior tibiæ very broad and hatchet-shaped: *L. Latreillii*, MacLeay (*ænea*, Boisd.); *L. splendens*, new species; *L. fulgida*, Boisd. (*aurata*, MacLeay); *L. rutilans*, new species; here also belongs *L. ænea*, MacLeay (*Lethr. æneus*, Fab.) In the others, the same terminal horn of the anterior tibiæ is narrower and knife-shaped: *L. viridis*, new species; and *L. Micardi*, Reiche. *L. pygmaea*, MacLeay, is doubtful.

Two Guinea species of *Passalus* have been described by Imhof (Verh. der Naturf. Ges. zu Basel, v. p. 171): *P. parasticus*, like the *P. barbatus*, F., but the antennal club is three-leaved (in that it is five-leaved), is new; the other, *P. dasypleurus* (p. 172), appears to me identical with *P. planiceps*, Esch.

TENEBRIONES.—The Marquis de Brème has published, in the Rev. Zool. p. 81 and 106, and also under a separate title, "Monographie de quelq. genr. de Coléoptères hétéromères appartenant à la tribu des Blapsides, 8vo., avec une planche au trait. Paris, 1842;" a monograph of one group of *Blapsides*, which embraces *Misolampus*, *Sphærotus*, and some other allied genera. *Misolampus* has four species, of which two are new: *M. lusitanicus*, like the *M. gibbulus*, but the dots upon the head and prothorax are more isolated and deeper, the elytra without striæ and irregularly dotted, is from Portugal; and *M. Ramburi*, with rows of

superficial points and extremely finely dotted interstices on the elytra, from Andalusia. *Sphærotus* has eight species, in three sub-divisions: *Sph. curvipes*, Kirby; *cribratus*, new species from Paraguay; *levigatus* and *costatus*, new species from Brazil, have a longish convex prothorax; *Sph. politus*, new species from Mexico, has a longish but less convex prothorax, narrowed anteriorly; *Sph. gravulus*, *thoracicus*, *mexicanus*, new species from Mexico, have a shorter and flatter prothorax, also the five penultimate joints of the antennæ less conical. *Zophius*, a new genus, founded on the *Helops rufo-pictus*, Wied.; *Heliofugus*, Guér. (*Amphyus*, Dej.), with the three species described by Guérin in the Mag. de Zool.; lastly, a new genus, *Dinomus*, allied to *Heliofugus*, but the clypeus not distinctly divided from the forehead, the prothorax almost of the breadth of the elytra, &c., with a single new species, *D. perforatus*, from Mexico. In the separately published treatise, the generic characters are figured.

In the group of the *Opatridæ*, the reporter has described (Arch. 1842, i. p. 172) one new New Holland genus, *Cestrimus*, with two new species from Van Diemen's Land, which has the habit of *Opatrum*, but is apterous, and differs in the undilated anterior tibiæ, &c.

Schüdté has given a description of the internal structure of *Opatrum sabulosum* (Kröyer, Naturh. Tidsskr. iv. p. 204).

Westwood (Proceed. Zool. Soc. 1841, p. 66) laid before the Zoological Society of London, a paper on some *Tenebrionidæ* of tropical Africa, in which several new species are described: *Chiroscelis bifenestrella* and *passaloides*; *Prionscelis* (*Iphius*, Dej.) *Rauldoni* and *crassicornis*, from Guinea; and *Odontopus tristis*, from Senegal? There is a continuation in the Proceedings for 1842, p. 117. Besides seven species of *Nyctobates*, *N. mærens*, *confusus*, *punctatus* (*Helops punct.*, F.), *hypocrita* (*Iphthyn. kyp.*, Dej., *guineensis*, Western.), *transversalis*, *brevicornis*, *rotundicollis*, four new genera are described: *Calostegia*; large, oblong, sides of prothorax serrated towards the anterior angle; antennæ short and thick, the 7-10th joints larger than the rest, the eleventh still larger and somewhat pointed; the interior maxillary lobe has a hooked tooth at the point, all the thighs with two spines near their apex, tibiæ sinuated on the inner side both above and below their middle: *C. purpuripennis*, from Ashantee. *Nesioticus*; short, round, strongly gibbous, inner maxillary lobes without hooks, terminal joints of the maxillary palpi hatchet-shaped, antennæ compressed, a little thickened towards the point, legs simple, mesosternum forming a blunt projection: *M. flavopictus*, from the Gold Coast. *Ogcosoma*; short and very broad, antennæ thin, scarcely thickened towards the point, both maxillary appendages membranous, prothorax convex, all the angles sharp, elytra convex with interrupted ribs, legs thin bristly: *O. granulare*, from Gambia. *Megacantha*; thick and convex, eyes kidney-shaped, inner

maxillary lobe membranous; antennæ long, the last joints, from the seventh, somewhat broader; prothorax rounded, legs long, anterior thighs with one tooth, anterior tibiæ crooked, middle tibiæ in the male serrated internally (on the anterior tibiæ the tooth and crook is stronger in the male): *M. tenebrosa*, from Ashantee.

Of two New Guinea species described by Imhof (Verhandl. der Naturf. Ges. zu Basel, v. p. 174), one, *Iphthinus crenato-striatus*, is identical with the *Nyct. hypocrita*, Westw.; the other, *Tenebrio guineensis*, is known under the name of *T. subrugosus*, Dej.

The reporter has described several species from Van Diemen's Land (Arch. 1842, i. p. 174), namely, *Upis* (*Iphthin.*) *angulatus*, *Tenebrio humilis*, *colydioides*, *corvinus*.

Hope (Guér. Magas. de Zool. Ins.) has figured *Calcar* (?) *inhumatus* (pl. 89), and *Monomma resinosum* (pl. 87), both from Gum. Animé. The latter is nearly allied to *M. marginata* (*Tritoma m.*, Fab.), but is not the same; the former must, at all events, be more minutely examined to determine its genus.

A monograph, by the Marquis de Brème, on the group *Cossynhidae*, Paris, 1842, has reached me, but I must defer my report upon it till next year, when it will be completed. From the notice in the Rev. Zool. 1843, p. 46), it is at present to be understood, that the author unites the *Hebeus* (with the exception of *Cilibe*) with *Cossyphus*, and divides the former into four, the latter into two sub-genera.

The reporter (Arch. 1842, i. p. 175) has described *Cilibe peltata* as a new species from Van Diemen's Land, and founded a new genus, *Saragus*, upon the *Silpha levicollis*, F., which (l. c. p. 171, t. 4, f. 7) was placed with the *Pedinite*, but which now appears to me more closely allied to *Hebeus*.

Imhof has enriched the group of the *Helopie* (Verhandl. d. Naturf. Ges. zu Basel, v. p. 175) with two new species of *Stenochia*, *St. cribripennis* and *cupripes*, and one of the (still undescribed) genus *Hybonotus*, Dej., *H. femoralis*; all from Guinea.

The reporter (Arch. 1842, i. p. 175) has described three new species of *Adelium* from Van Diemen's Land, and characterized two new genera: *Olisthaena* (p. 177, t. 4, f. 8), and *Titena* (p. 178, t. 4, f. 9); the former with one, the latter with two new species.

The new genus, *Ulodes* of the reporter, belongs to the *Diaperiæ*, and has one new species, *U. verrucosus*, from Van Diemen's Land (l. c. p. 180, t. 5, f. 1). *Bolitophagus Sapphira*, Newman (Entomologist, p. 404), from Port Philip, appears to be a very distinct new species.

Margus obscurus, Redtenbacher (Col. Austr. p. 17), from Austria, may be placed as synonymous with *Teneb. madens*, Charp.

A new genus, *Blepusa*, of the group *Cistelidæ*, has been described by Westwood (Transact. Ent. Soc. iii. p. 69, t. 3, f. 3). It is *Alleculi-*

form, with membranous appendages on the middle tarsal joints, distinguished by the transverse hatchet-shaped terminal joint of the palpi. *Bl. costata*; glossy black, with alternately elevated interstices of the punctate striae on the elytra; 6''' long; probably from Mexico.

Cistela sulfuripes, Dahl, Redtenbacher (Col. Aust. p. 18), has already been described by Germar under the same name (Spéc. ins. nov.)

MORDELLONES.—*Mordella promiscua* is a new species of the reporter's from Van Diemen's Land (Arch. 1842, i. p. 181).

SALPINGIDÆ.—The reporter has remarked (l. c. p. 183), that the European species of *Salpingus* separate into two forms: the one (*Sphaeriestes*, Kirby: *S. ater*, *picæ*, *bimaculatus*, *foveolatus*) has the last five joints of the antennæ imperceptibly thickened, and the margins of the prothorax simple; the other (*Salpingus*, Latr., *Lissodema*, Curt.: *S. cursor*, *dentatus*) has the last three antennal joints remarkably thickened, and the margins of the prothorax dentated. Between these stands *Salp. hybridus*, from Van Diemen's Land, which agrees with the latter in the antennæ, and with the former in the prothorax.

LAGRIARIÆ.—In this family might be reckoned an insect from Gum. Animè, which Hope figured under the name of *Megalocera rubricollis* (Guér. Mag. de Zool. Ins. pl. 88.) It is slender, with spreading serrated antennæ with triangular joints, projecting eyes, punctate-striate elytra, and small and lobed penultimate tarsal joint.

ANTHICIDÆ.—Dr. Schmidt of Stettin has published a treatise on the European species of *Anthicus*, in the Entomol. Zeitung (p. 79, 122, 170, 193). He divides the *Anthicus*, F., into three genera: *Notoxus*, Geoff., with squarish mandibles, and filiform antennæ, also easily to be recognised by the cornuted prothorax; *Anthicus*, with triangular mandibles, and somewhat filiform antennæ; *Ochthenomus*, Dej., with triangular mandibles, and club-shaped antennæ. Six species of *Notoxus* are mentioned, of which three are new: *N. major*, Dej., from different parts of the South of Europe; *N. armatus*, from the Tyrol, nothing more perhaps than a slight variety of the *N. cornutus*; and *N. miles*, a good species from the Banat, chiefly differing from *N. cornutus*, by the truncated points of the elytra.

Thirty species of *Anthicus* are described: among these, as new, No. 4. *A. terminatus*, Dej., from Corfu, a species varying much in colour, with which No. 12. *A. ruficollis*, is to be united as a variety; No. 6. *A. longicollis*, from Hungary and Italy; No. 11. *A. tristis*, from the South of France; No. 12. *A. ruficollis*, from the South of France and North of Italy (variety of No. 4. *A. terminatus*, Dej.); No. 13. *A. unifasciatus*, Dej., from the Tyrol, North of Italy, and South of France (already figured as *A. fasciatus*, Chevr. in Guér. Iconogr. Règn. An.); No. 14. *A. monogrammus*, Kunze, from Nice (same with *A. cinctus*, Rossi, *affinis*, Dej.); No. 15. *A. sardous*, Kunze, from Sardinia; No. 16.

A. amœnus, from Avignon (*tepellus*, Hoffg., Dej.); No. 18. *A. melanarius*, from Marseilles (same with *plumbeus*, Dej.); No. 19. *A. unicolor*, from Styria, Hungary, and France; No. 20. *A. brevis*, from Marseilles; No. 21. *A. callosus*, *ibid.* (same with *A. brunneus*, Ferté Sén.); No. 22. *A. fenestratus*, Dej., from Italy and the South of France; No. 25. *A. instabilis*, Hoffg., from the South of France and Spain; No. 26. *A. axillaris*, from Hungary and Italy; No. 27. *A. luteicornis*, from Upper Bavaria; and No. 30. *A. pulchellus*, Dej., from the South of France and Spain. The genus *Ochthenomus* contains one new species, *O. sinuatus*, Kunze, from Italy and the South of France, with the *O. tenuicollis*, widely distributed in the South of Europe (*Notox. ten.*, Rossi, *O. angustatus*, Dej.); to the latter also belongs Laporte's *A. elongatissimus*, for which he prefers the generic name *Endomia*, which is not a whit more correct than that of Dejean, and deserves no more attention.

The Marquis de la Ferté Sécotère has furnished another contribution to the knowledge of the species of *Anthicus* (Ann. de la Soc. Ent. de Fr. xi. p. 247). He has described and partly figured fourteen species, found at a single spot at Perpignan: *A. guttatus*, Hoffg., Dej. (this delineation is founded on one furnished by Dejean; in the Hoffmannsegg Collection the species is named by Alters, the 4-*guttatus*, Rossi; it is therefore not new); *A. affinis* (is a variety of *A. cinctus*, Rossi, and certainly *A. monogrammus* var. γ , Schmidt); *A. brunneus* (same with *callosus*, Schm.); *A. antoniae* (doubtful, perhaps a variety of the *A. terminatus*, Dej.); *A. plumbeus*, Dej. (same with *melanarius*, Schm.); *A. tenellus*, Hoffg., Dej. (same with *A. amœnus*, Schm.); *A. Bremi*, a species very nearly allied to the *humilis*, Germ., and *riparius*, Dej., which, however, appears to differ by slenderer legs, shining underside, &c. (it is the same with *inquisitor*, Gené); *A. minutus*, allied to the preceding, but the vortex is not pointed posteriorly (same with *cursor*, Gené, *salinus*, Hef.); *A. melanophthalmus*, a very distinct species (like several of the others it is found also in Italy, but especially in Sicily); *A. pulchellus*, Dej.; lastly, the author gives a description of the *A. instabilis*, Hoffg. There are several, as may be inferred from the remarks appended, which have been also described by Dr. Schmidt, partly under the same, partly under other names.

Two new species have been described by the reporter, from Van Diemen's Land, *Anthicus strictus* and *vinctus* (Arch. 1842, i. p. 182). *Xylophilus nigrinus*, Germar, Faun. Ins. Europ. 22, 7, 8 (♂ and ♀), is a new German species, which has received from the reporter the same name in the Berlin collection.

VESICANTIA.—The genus *Meloe* has received an addition of three new species from Guérin (Rev. Zool. p. 338): *M. foveolata* from Tripoli, is distinguished from *M. cicatricosus* and *coriarius*, by the pitted elytra; it must, therefore, perhaps stand next to *M. erythrocnemus*: *M. hume-*

ralis, from an elevated plain of the Cordilleras; and *M. andensis*, from the top of the Andes; both have the terminal spines of the posterior tibiæ simple, like *M. cancellatus*, but differ from it, the former by its cleft claws, the latter by its entire simple ones. The latter is deceptively like the *M. Klugii*, but is distinguished from it by the terminal spines of the tibiæ and the claws.

Harris gives some information concerning the occurrence of the North American species of *Lytta* (Ins. of Massachus. p. 109). Most of the species seem to prefer the potato plant, especially the *L. vittata* and *cinerea*, which attack it in masses; *L. marginata* prefers the *Clematis virginiana*, also *Cl. viorna* and *crispa*; *L. atrata*, F., the *Solidago altissima*. The *Meloe angusticollis*, Say, which is common in autumn, and feeds on the leaves of the *Ranunculi* in preference, also attacks the potato plant.

CURCULIONIDÆ.—The second half of the sixth (second supplementary) volume of Schönherr's great work, "Genera et Species Curculionidum," has appeared. It contains the groups *Cleonides*, *Molytides*, and *Byrsopides*. In the first, the genus *Cleonus* is rightly extended by the suppression of *Bothynoderus*, as also that of *Epicerus* by *Graphorinus*; on the other hand, a number of new genera are added, viz.,—*Phastologus*, nearly allied to *Gronops*, but differing in the form of its body; and *Rhyparosomus*, resembling *Listroderus*, both South African forms; *Byrsopages*, approaching *Hyllobius*, native of Kamtschatka; *Strangaliodes*, differing from *Barynotus* by the prothorax being lobed before the eyes (von Bar. vorzüglich durch das vor den Augen gelappte Halsschild unterschieden.), with a Chilean species; *Cutoptes*, standing nearest *Liophkeus*, from New Zealand; *Catapionus*, from Cashmere, allied to *Liophkeus* and *Barynotus*; *Amphidees*, Mexican; *Odontorhinus*, from Persia, very near *Barynotus*; *Tropiphorus*, principally separated from *Barynotus* by the want of the scutellum, containing the *B. mercurialis*, *carinatus*, *globatus*, &c.; *Perperus*, New Holland, having the habit of *Otiorhynchus*; *Panscopus*, formed from the *Barynotus erinaceus*, Say; *Megalometis*, Chilean; *Rhydidophkeus*, containing the *Curc. albipes*, Ol., from Madagascar; *Bastactes*, Brazilian.—Under the *Molytides*, the old genus *Molytes* is divided into *Molytes (coronatus, &c.)*, *Trysibius (tenebrioides, Pall., &c.)*, *Anisorhynchus (bajulus, monachus, &c.)*, and *Leiosomus (ovatulus, Clairv., &c.)* *Sotasmus*, nearly allied to *Plinthus*, and *Cylindrorhinus*, Guér., both from New Holland; *Macrotarus* from anterior Asia, nearly approaching *Phytonomus*, are also newly characterized. Finally, by way of appendix, *Procas*, Steph., is added; *Erirehinus Stevni*, Schönh. iii., placed in it, and its situation shown to be next *Lepyrrus*.—To the *Byrsopides*, *Synthocus*, from Africa, *Perieges*, from the Caucasus, *Borborocætes*, from Persia, *Hypocolobus*, from South Africa (one of the twenty species was previously joined with

Spartecerus), and *Epipedus*, from the interior of Cayenne, have been added as new genera; besides this, almost all the earlier genera are enriched with new species; as the typical specimens of the earlier descriptions were mostly given back to their owners, and thus served no longer for comparison, it could not be avoided, that frequently known species were described as new, an error of slight consequence in the very great utility of the work. I have remarked, in the report for 1839, p. 257, that the genus *Eublepharus*, Sol., which the author mentions under the *Cleonides*, as distinct, but unknown to him, falls under *Lophotus*, Sch. (*Egorhinus*, Er.)

Labram and Imhoff have concluded, with the tenth number, a volume of their "Gattungen der Rüsselkäfer," and also given a review of its contents. This tenth number contains *Mecocerus diversipes*, Imh., a new species from Guinea; an exact analysis and copious description of the previously characterized genus *Dentrocraates*; *Blaberus fallax*, Sch., from the Cape; a new species from Madagascar, under the name of *Apoderus camelus*, Sch., which was called by Klug, in the Berlin collection, *Ap. castaneus*; as a new species, the *Rhynchites grandis*, from the Philippine Islands, which is the *Rh. celestinus*, Schönh. (*Philippensis*, Chev.); *Gamarotus coccinelloides*, Sch., from a drawing by Germar (fresh specimens are thickly dusted with yellow); the true *Platynerus Germari*, Sch., because, in the first number, *Pl. Dreyei* was represented under this name.

Some Rhynchophorous Beetles, of Van Diemen's Land, have been described by the reporter (Arch. 1842, p. 183-212), viz.,—one *Anthribus*, two *Tropideres*, one *Rhinotia*, one *Rhynchites* (*Atletes*), two *Eurhynchus*, one *Amisallus*, two *Aterpus*, one *Pelororhinus*, one *Rhinaria*, one *Steriphus* (new genus allied to *Plinthus*), two *Amycterus*, one *Nothrodes* (characterized as a new genus of the group *Otiorynchidae*, but, as it seems to me, coming under the genus *Pantopus*, since published by Schönherr), four *Mandalotus* (a new genus most nearly allied to *Tyloderes*), two *Orthorhinus*, one *Erirhinus*, one *Notionomus*, one *Cryptopus* (a new genus, allied to *Anoplus*), one *Meriphus* (a new genus of the group *Erirhinæ*), one *Diapelmus* (a new genus near to *Anthonomus*), eight *Cryptorhynchus*, three *Acalles*, one *Cyllorhamphus* (ranking with *Mitrephorus*, Sch.), three *Melanterius* (a new genus most nearly allied to *Chalcodermus*, Sch.), two *Rhyncolus*, one *Tomicus*, one *Cryphalus*.

Several new East Indian *Curculionidae* have been made known by Guérin in Delessert's Voyage (ii. p. 51-54): *Mecocerus gibbosus*, *Episomus montanus*, *Baridius neelgherensis*, *Myllocerus subfasciatus*, from the Nilgherries; *M. Fabricii*, from Pondicherry.

Waterhouse (Proceed. Ent. Soc. p. 62; Ann. Nat. Hist. x. p. 68) has described two new genera, allied to *Rhynchites*:—*Minurus*; rostrum elongatum ad apicem dilatatum, antennæ elongatæ tenues versus medium

rostri insertæ 11-articulatæ articulis basalibus sub-æqualibus, elytra oblonga abdomen tegentia: *M. testaceus*, from Chiloe; and *Metopon*; antennæ tennes ad basin rostri insertæ 11-articulatæ articulis basalibus sub-æqualibus tribus ultimis clavam sub-solidam formantibus: *M. suturalis*, a new species from Van Diemen's Land. To this latter genus the *Rhynchites* (*Auletes*) *melanocephalus*, described by the reporter (Arch. 1842, i. 185, n. 112), appears to belong.

Guérin has given an excellent iconographical arrangement of the species of *Eupholus*, in the Magas. de Zool. (1842, Ins. pl. 96, 97).

Waterhouse (Ann. Nat. Hist. ix. p. 302) began a monograph on the Philippine species of *Apocrytus*.

Several new species from Austria have been described by Redtenbacher (Col. Austr. p. 19-21):—*Phytonomus maculatus*, Dahl, living on the *Verbascum phlomoides*; *Otiorhynchus mandibularis*, *Hylesinus suturalis*.

Germar has made some very valuable observations on the synonymes of different European *Carcilionida* (Entom. Zeit. p. 2 and 98). A present from Mr. Walton, of English *Carcilionida*, very exactly defined according to Marsham, Kirby, and Stephens, gave rise to this treatise; an account is, therefore, given principally of the English species hitherto imperfectly known on the continent. Schmidt (ibid. p. 110) has shown, that the Swedish authors, under *Otiorhynchus ater* and *niger*, have not meant the Fabrician species of the same name (*villosopunctatus*, Sch.), which is not found in Sweden, but a variety of the *O. tenebrioides*. Junker (ibid. p. 63) has pointed out, that by *Rh. viminalis*, F., recently developed yellow individuals of the *Orchestes quercus*, as they appear in summer, are meant, whilst the completely coloured individuals show themselves in spring as soon as the oaks bud.

Goureau has published a long essay on the natural history of the *Pissodes pini* (Ann. de la Soc. Ent. de Fr. xi. p. 53). Dr. Schmidt (Entom. Zeit. p. 273, fig. 3-7) has described the metamorphosis of the *Lixus gemellatus*, Sch., which lives in the stalks of *Cicuta virosa*. Leunis (ibid. p. 190) has made known his experience, that the larva of *Brachytarsus scabrosus*, lives in the cocoon of the *Carpinus betulus*, in which also the metamorphosis goes on, so that the beetle proceeds from the cocoon pustule.

Schiodte has investigated the internal structure of the *Otiorhynchus atro-apterus* (Kröyer, Naturh. Tidsskr. iv. p. 212).

Harris has imparted much information on the different Rhynchophorous Beetles of North America (Ins. of Massachusetts, p. 53-76). *Bruchus pisi* is so injurious to the growth of peas, that in many districts they cannot be cultivated. *Attelabus analis* and *bipustulatus* are found upon oak leaves. Several species of *Rhynchites* are hurtful to the vine, particularly *Rh. bicolor*. *Pandeticus hllaris* lives on

the white oak,—the beetle on the leaves, the larva in the stem. *Hylobius pales*, Hbt., lives in pine wood; also *H. picivorus*, Germ., and *Pissodes Strobi*, Peck (*nemorensis*, Germ.), often destroying tracts of several thousand acres of wood. In gardens, *Conotrachelus nemophar*, Hbt. (*argula*, F.), is particularly detrimental, chiefly to plums, but also to several other fruit trees; it pierces the fruit as soon as it is formed, and there lays its egg. The larva gnaws the fruit, which decays and falls off as soon as the larva is grown. The metamorphosis goes on in the ground. If these insects are numerous, no plums ripen. The same beetle causes, by its perforation, warty excrescences on the younger twigs, in which also larvæ are found, and in consequence of the circulation of the sap being disturbed, the branches die above these galls. *Calandra granaria* and *oryza* are destructive almost every where to the grain laid up in granaries, the latter not only to the rice, but also to the maize. Of Bark Beetles, the *Hylurgus teretans* is found in the pitch fir; *H. dentatus*, Say, in the red cedar; *Tomicus exesus*, Say, in the pitch fir; *T. pini*, Say, in different species of pines; *Scolytus pyri*, Peck (not an *Eccoptogaster*, rather a *Tomicus*), in pear trees, in the sap of the branches, which die in consequence of its gnawing.

Hornung (Entom. Zeit. p. 115) discovered a number of Bark Beetles inhabiting Betel-nuts (*Areca catechu*). *Bostrichus dactyliperda*, F., was most numerous; *B. palmicola* and *carpophagus*, both allied to the preceding, occurred more rarely. *B. areca*, a small new species, was abundant.

BRENTHIDES.—Harris has given some information concerning the larva of the *Brenthus* (*Arrhenodes*) *septentrionis* (Ins. of Massachus. p. 60). When full grown, it is above 1" long, and scarcely 1" thick; almost cylindrical, only somewhat flat beneath; white, with the exception of the last segment, which is horny dark brown, hollowed out obliquely posteriorly and deputed at the margin. The thoracic segment bears legs, and at the end next to the body there is a fleshy pseudo leg, from which it is very evident that it has no alliance with that of the *Curculionidæ*, but rather with that of the *Eluteridæ*, or perhaps still more the *Colydiæ*. Further comparison must show how far it may agree with the one or the other. According to the opinion of the author, the larva bores in the wood; the female pierces with her thin proboscis the bark of the white oak, and lays an egg in each perforation. The larva makes cylindrical passages in the hard wood, which it always keeps free, as it pushes out the chips to the external opening with the last segment of its abdomen, so that these passages are easily detected. The change to the pupa takes place in the larva-passage. The pupa has upon its back transverse rows of small spines and sharp teeth, which probably serve to retain the cuticle when the beetle escapes.

Harris would place the *Brenthides* at the end of the *Curculionidæ*.

but the reporter is of opinion, that the difference is too considerable for the *Brenthidæ*, which have hitherto been considered as a totally anomalous member of that family, to be farther united with it.

A plate of *Cephalobatus macrocephalus*, Sch. (♀), has been given by Labram and Imhoff (Gatt. der Rüsselkäfer, 10 Lief.)

COLYDII.—Several new genera have been characterized:—

Deretaphrus, Newman (Entomologist, p. 403), is so far mistaken by its author, that he reckons it with the *Ptinites*. It is most nearly allied to *Bothrideres*, Dej. (*Lyct. contractus*, F.), and differs principally in the antennæ having not the first but second penultimate joints larger. There are four species mentioned from Port Philip; of these, however, only the first, *D. fossus*, from which the generic characters are taken, and probably also the second, *D. puteus*, belong to this genus; at all events, the last two, *D. illusus* and *vittatus*, are true *Bothrideres*. The Berlin collection contains three other species of real *Deretaphrus*, from different parts of New Holland.

Pynomierus of the reporter (Arch. 1842, i. p. 214, t. 5, f. 4), hitherto confounded with *Cerylon*, shows striking varieties in the formation of the antennæ in its different species. The native *P. tetrans* has ten-jointed antennæ; *P. sulcicollis* (*Cerylon s.* Germ.), has only eight-jointed ones, both with a knob-shaped thickened terminal joint. Other species, as *P. reflexus* and *hematodes* (*Lyct.*), Say, as well as the new species from Van Diemen's Land, *P. fuliginosus*, have eleven-jointed antennæ, with a two-jointed club.

Latomctus of the reporter (ibid. p. 213, t. 5, f. 3) is heteromorous, therefore differing from the remaining genera of this family in the number of tarsal joints, but showing much agreement with *Sarrotrium*, *Coxclus*, &c., which have all the tarsi only four-jointed: *L. pubescens* is a new species from Van Diemen's Land.

Langelandia, Aubé (Ann. de la Soc. Ent. de Fr., xi. p. 225, t. 9, f. 2-6), is a new genus, remarkable in many respects, which has been placed by its author in this family. It has, with a proportionably longer prothorax, the appearance as well as the antennæ of *Ditoma*, but wants eyes, and, like all blind insects, is apterous. The tarsi are all only three-jointed. *L. anophthalma*, discovered in France by Langeland, lives in the earth in the mouldering remains of plants.

Ditoma interrupta of the reporter is a new species from Van Diemen's Land (Arch. 1842, i. p. 215).

The internal structure of the *Sarrotrium muticum* has been described by Schiödt (Kröyer, Naturh. Tidsskr. iv. p. 209), as that of a remarkable variety of *Opatrum*, with which the author found a great agreement. The circumstance is passed over, that the six gall-vessels are here fixed by their ends to the thin gut, whilst in the *Opatrum* they form loops.

PAUSSIDÆ.—A newly discovered East Indian *Paussus* has been laid before the Linnæan Society by Westwood, under the name of *P. hearayanus* (Ann. Nat. Hist. x. p. 409). It belongs to the second division of the genus, approaching *Platyrhopalus*, in having the penultimate joint of its labial-palpi about two-thirds the length of the terminal joint, and is only distinguished from *Paussus cognatus* by the antennæ.

Germar's *Thorictus* belongs to a family still undefined, of which he has figured a small Sicilian species as *Th. grandicollis*. (Faun. Ins. Eur. xxii. 4.)

CUCUJIDÆ.—Letzner (Arbeit. d. Schles. Gesellsch. f. Vaterl. Kultur, i. j. 1842) opposes the assertion of Gyllenhal, in regard to the sexes of the *Cucujus depressus*, as his observations on living beetles have convinced him, that the heteromerous individuals are not, as supposed by Gyllenhal, the males but the females. It appears, however, from the account, that he is deceived by the ovipositor of the females. The larva of this rare beetle has also been observed by him. It appears to agree very nearly with the larva of *Brontes*, described by the reporter; it lives, for a year at the most, under the bark of old fir posts.

The new genus, *Platius*, of the reporter (Arch. 1842, i. p. 216) has the closest agreement with *Cucujus*, and principally differs in the first tarsal joint being as large as the following one: *Pl. fuscus* is from Van Diemen's Land.

Phlæostichus, Redtenbacher (Quæd. Col. Austr.); has the antennæ with three larger terminal joints; the prothorax with teeth on the sides; the tarsi are described by the author as heteromerous. On a specimen which I had an opportunity of examining, I found five joints on all the tarsi, but the first was certainly very short. There is here, perhaps, also a similar distinction of sex as in *Cucujus*. *Phl. denticollis* is like a *Salpingus*, dull black, finely downy, with two sinuated dark yellow bands on the elytra; it is found under the bark of the maple tree.

Stemmoderus, Dej., has been published by Spinola (Guér. Mag. de Zool. 1842, Ins. pl. 91). This beetle stands in near relationship to *Rhysodes*; the antennæ are rather short; the joints cylindrical and closely connected; the head convex beneath; the eyes large and kidney-shaped; the labrum horny; mandibles flat, toothless, with a simple point; the mentum not quite concealing the opening of the mouth; the maxillary palpi rather long, with an oblong-oval terminal joint truncated at the point; legs elongated; tibiæ simple; tarsi evidently five-jointed. *St. singularis*, Dej., from Senegal, is castaneous; 4''' long; the forehead has three protuberances, flat in the middle, swollen out on each side into two great bladder like-pads; the prothorax is covered posteriorly by two knobs like balls, but flat on the back; the elytra furrowed, with anterior angles strongly projecting forwards.

The reporter has described two *Brontes* from Van Diemen's Land, one *Dendrophagus*; and one *Silvanus*, as new species (Arch. p. 217).

LONGICORNES.—The species of this family, collected by Cuming in the Philippine Islands, have been described by Newman, though not with sufficient accuracy. (Entomologist, p. 243, 275, 288, 298, 318, 369, 381.)

From Harris's observations on the North American *Certambicidæ* (Ins. of Massachus. p. 77), it appears that the larva of the *Prionus laticollis*, Drury, (*brevicornis*, F.) lives in poplars; that of the *Stenocorus* (*Cerasphorus*) *cinctus*, Drury, (*garganicus*, F.) in hickory trees, boring through the stem in all directions; *Elaphidion putator* (*Stenoc.*), Peck, is found in the black and white oaks, and according to Peck's observations, the larva lives in the pith of the boughs, and at last gnaws through the wood, and undergoes its metamorphosis when lying on the ground. *Callidium bajulus* and *violaceum* have been brought from Europe, and become native to North America. The beautiful *Clytus speciosus*, Say, (*Hayi*, Griff.) is occasionally destructive to the sugar maple, into the wood of which the larva bores; that of the *Cl. flexuosus* lives under the bark, and in the alburnum of the *Robinia pseudacacia*. The larva of the *Saperda calcarata*, Say, lives, like our *S. carcharias*, in the stems of different species of poplar; that of the *S. bivittata*, Say, in apple trees, to which they do great injury, as well as in various trees and bushes, but originally it preferred the North American *Aronia*. The larva of the *S. (Oberea) tripunctata* lives in the pith of the branches of a species of bramble (*Rubus villosus*), which is cultivated abundantly for the sake of its fruit resembling the currant. *Desmocerus palliatus* is found upon the elder tree; the larva lives in the lower part of the branches in the pith. The larva of the *Rhagium lineatum* lives under the bark of the pitch fir, which comes off by its gnawing, and the tree is destroyed.

Spinola has published a valuable treatise on the systematic arrangement of the *Prionidæ* (Mem. della R. Acad. d. Scienz. d. Torino. 2, Ser. v.) He comprehends, in one large division, all those beetles in which the first three tarsal joints are covered beneath with hairy felt, and the fourth is very small and narrow, and united to the fifth, as the *Curculionidæ*, *Cerambycidæ*, and *Chrysomelidæ*. This division he separates into two groups, either as the prothorax consists of tergum, episterna, and prosternum, or only of a single piece, generally of a tergum and prosternum. The first group contains the *Bruchidæ* and *Halticæ* (both defined as springing, which is not suitable for the former, as all springing insects have straight tibiæ; those with crooked tibiæ, like the *Bruchidæ*, however much the thighs may be thickened, are not springers), the *Hispidæ*, *Gallerucidæ*, *Chrysomelidæ*, and *Prionidæ*. The second group contains the *Cerambycidæ*, *Lamiæ*, and *Curculionidæ*. The *Prionidæ* are separated from the rest, by the cylindrical anterior

hips lying in corresponding sockets. This gives an excellent character for the group of the *Prionidae*. In some, as *Macrodonia*, the prosternum is not separated by a suture, and the whole prothorax consists of a single piece, so that the separation of the *Prionidae*, from the rest of the *Cerambycidae*, cannot be justified on this ground; at least if the larvæ be also taken into consideration, which have the greatest agreement with the *Cerambyces* proper, and particularly the *Leptures*.

The new genus *Rhipidocerus*, Westwood (Transact. Ent. Soc. iii. p. 70, t. 3, f. 2), is one of the few forms of *Cerambycidae* with flabellate antennæ; in both sexes these are of the length of the body, in the male the third and following joints have each a long fan-like branch, in the female they are simple; the prothorax has one spine on each side; the elytra are simple and rounded at the end; the legs short and similar. In many points this beetle resembles a *Lamia*; in others, particularly the minutely punctured elytra, a *Stenocorus*. Westwood places it between *Phenicocerus* and *Polyzoa*; it approaches nearest the latter genus, at least the parts of the mouth, eyes, and joints of the antennæ indicate its situation among the *Prionidae*. *Rh. australasiae*; dark green with fine yellowish hairs, and reddish-brown antennæ and legs; is a native of New Holland. The generic name is actually identical with *Rhipicera*.

A new European form of *Prionidae* has been described by Mulsant, under the generic name of *Prinobius* (Ann. d. Sc. Phys. publ. par la Soc. d'Agriculture d. Lyon, v. p. 107, t. 11, f. 1). It resembles *Macrotoma*, having likewise the third antennal joint as long as the two following ones put together; the eyes are almost without emargination; the prothorax is transverse and quadrangular, having a small tooth on the posterior angles; the tibiæ are, however, unarmed; but I know not wherein it differs from *Ergates*. *Pr. Myardi* is found in Corsica, under oak bark; it greatly resembles *Pr. Germari*, Dej., (*scutellaris*, Germ.) and it is principally distinguished by the broader prothorax; it may very likely be the male of that insect, particularly as in *Ergates faber*, a similar distinction of sex is seen; at all events, the *Pr. Germari* is diffused over the islands on the west side of Italy. The Berlin collection was enriched by Schüppel with a beautiful specimen of this rare insect, which was caught at Cagliari in Sardinia.

Newman (Entomol. p. 351) has founded a new genus *Cnemoplites*, which ought to be received; it has the anterior tibiæ dentated on the outer side. He includes in it *Pr. spinicollis*, MacLeay (King's Voy. ii. 449), to which he adds, as a synonyme, *Mallodon australis*, Boisd.; also a new species *Cn. edulis* from Port Philip; and lastly, *Mallodon manillæ*, Newman (Entomol. p. 247), from Manilla. *Macrotoma australis* of the reporter (Arch. p. 218), from Van Diemen's Land, may be added, and perhaps also *Mallodon insulare*, Hope (Proc. Ent. Soc. p. 48),

from Port Essington. It has already been remarked in last year's report, that the genus *Oncinotus* of the reporter (ibid. p. 219, founded upon *Pr. arcuatus*, F.) falls under *Toxécutes*, Newm.

Blanchard (l'Instit. p. 23) has made known a beetle from Tangiers, under the name of *Prionus Favieri*, which is very injurious to the palm trees. It may, however, be synonymous with *Pr. forficatus*, F.

Newman has described two new species from Manilla, *Macrotoma ægrotum*, and *absurdum* (Entomol. p. 247).

There are two new American species of *Prionide*, *Callipogon Lemoinei*, Reiche (Guér. Mag. d. Zool. Ins. pl. 98), from New Granada, distinguished from the *C. barbatus* by a broad longitudinal band of white felt on each elytron, interrupted anteriorly; and *Derobrachus Levoiturieri*, Buquet (Ann. d. l. Soc. Ent. d. Fr. xi. p. 203, pl. 9, f. 1), from Columbia.

The new genera of the group *Cerambycidae* are:—

Euchroa, Guérin (Deless. Souv. d'un Voy. d. l'Ind. ii. p. 56, t. 14, f. 1), allied to *Pachyteria*, but certainly not distinguishable from *Nireus*, Newman, as also the species *E. dimidiata*, Guér., from Pulu Penang, is the same with *N. tricolor*, Newm.

Sclethrus, Newm. (Entomol. p. 247), founded upon the *Ibidion amœnum*, Guér., is very different from *Ibidion*, and resembles a *Tricondyla*.

Ceresium, Newm. (ibid. p. 322), allied to *Obrium*, with a narrow head elongated anteriorly; includes three new species from the Philippine Islands, *Obr. innite* and *æthiops* (p. 247), and *C. raripilum* (p. 322). Newman remarks, that the New Holland *Call. intortum* and *vile*, perhaps belong also to this genus (ibid. p. 223).

Omotes and *Sophron*, Newm. (ibid. p. 353, 354), are two new genera from New Holland, apparently allied to *Callidium*, which at present I do not know, and cannot discover the essential characteristics from the description.

Mecynopus of the reporter (Arch. 1842, i. p. 222), belonging to the *Necydalide*; elytra as in *Stenopterus*; antennæ and legs long, especially the hind ones; thighs only slightly thickened. *M. cothurnatus* from Van Diemen's Land.

Blanchard has again attracted discussion to the *Purpuricenus Loreyi*, Duponch. (Ann. d. l. Soc. Ent. d. Fr. xi. p. 49). He takes the view of Buquet, that the *Eburia* stands near it, and the *E. dimidiata*, Chevr., nearest, but thinks that both these, in some "plus" and "moins," vary from *Eburia*, and either form a peculiar genus *Heterops*, or *Cerasphorus*, *Coccoderus*, and *Chlorida*, must be united with *Eburia*.

Redtenbacher has described, as a new Austrian species (Col. Austr. p. 24), *Callidium scabricolle*, Meg., but it is the *Call. muricatum*, Dalm., Gyll.

Deilus fugax, Serv. (*Callid. f.*, Fab.), is figured by Germar (Faun. Ins. Europ. 22, 9).

Several species from French Barbary have been described as new by Lucas (Ann. d. Sc. Nat. xviii. p. 184). Of these the more remarkable are, —*Hamaticherus Mirbeckii*, which is hardly any thing else than *H. velutinus*, Dej.; *H. paludivagus*, which, so far as I can conjecture, does not differ from the *H. Neri*, Chev., of the reporter (*mauritanicus*, Buq.); *Purpuricenus barbarus*, which I hold as a variety of the *P. Desfontainii* (S. Wagn. Alger. iii. 162); *Hesperophanes rotundicollis*, *tomentosus*, and *affinis*; and, lastly, *Callidium thoracicum*, Dej., which has been already described by Mulsant under the same name, and is the true *Callid. melancholicum*, F.

Newman mentions, as new species, from the Philippine Islands (Entomol. p. 245), four *Hamaticherus*, three *Callichroma*, one *Polyzonus*, two *Arhopalus*, five *Clytus*, and one *Æmona*, on which he remarks, that this genus differs from *Petalodes* only by the simple antennæ, and that therefore, perhaps, it may be the female of it.

Hope mentions, as new species from New Holland (Proceed. Ent. Soc. p. 48), *Plocederus australis*, *Stenachorus vicinus*, *cruciger*, *Xystrocera australis*, *Callidium essingtoni*, from Port Essington; and Newman (Entomol. p. 352), *Phoracantha imbellis*, *Callidium artifex*, *terebrans*, *Omotes cucujides*, *Sophron inornatum*, from Port Philip. The reporter has described (Arch. 1842, i. p. 220), *Stenocorus præcox*, *Meropachys sericans*, *Phacodes personatus*, from Van Diemen's Land.

The group of *Lamie* has been enriched with a long series, not only of new species, but also of new genera, through the labours of Newman, on the Beetles collected by Cuming at the Philippine Islands. It would be difficult, however, for me to point out the characters of the new genera, as the author has often stated them in a very uncertain manner, and frequently left very essential circumstances untouched; for example, the thoracic formation, even where it is very remarkable. There are mentioned (Entomol. p. 275, &c.), *Dutocera*, with four species, of which three are new; *Anophlophora*, one new species; *Monohammus*, twelve species, of which ten are new; *Mimomorpha* (p. 322), a new genus, with one new species; *Lamia (pulchellator*, Westw.), (p. 288); *Agelasta*, a new genus, but which does not seem to differ from *Coptops*, Serv., with three new species, to which *C. edificator* might be added; *Abryna* (p. 289, 298, 323), a new genus, allied to the preceding, with five species; *Euclea* (p. 290), a distinct new genus, with two new species; *Cucia* (p. 290), a new genus, with a tuft of hair on the fourth antennal joint, containing two new species; *Planodes* (p. 323), a new genus, with one new species; *Doliops*, Waterh., with two species: *D. curculionides* and *geometricus*, Waterh., the latter characterized by Waterhouse (Proc. Ent. Soc. p. 55); *Agnia* (p. 291), a new genus, allied to *Ptychodes*, con-

taining two new species; *Plocia* (p. 292), a new genus, which apparently must be near *Colobotheca* and *Leptocera*, as well as *Hypsioma*, with two new species; *Hispomorpha* (p. 323), a new genus, like a *Hispa*, with one new species; *Achthophora* (p. 292), a new genus, like *Hypsioma*, with two new species; *Thysanodes* (p. 292), a new genus, but which should not be separated from *Sthenias*, Dej.; the species, *T. jucunda*, is *Cer. crocatus*, Ol.; *Gnoma*, with two species, of which one is new; *Apomecyna*, with one species, considered as new; *Astathes* (p. 299), the same as the genus *Tetraophthalmus* of Dejean, which name is inapplicable, with two new species; *Pluea*, with two new species; *Eustathes* (p. 300), a new genus, with one new species; *Tetraglenes* (p. 300), a new genus, like *Hippopsis*, but with four eyes completely separated, two oblong ones on the vertex, and a small round one on each side of the head, far removed from the antennae, containing one new species; *Epaphra* (p. 301), also allied to *Hippopsis*, with only two eyes; *Colobotheca*, one species; *Glenea* (*Sphenura*, Dej., Iap., which name should be altered, as it already belongs to a genus of birds), with seven species; *Isosceles* (p. 318), a new genus, including *Oberca seminigra*, Chev., and two new species, but properly, perhaps, corresponding to *Oberca*, Dej., as I do not find that the species from Manilla differ from the rest, such as *oculata*, &c.; under *Saperda* are two species generically very different, *S. ustulata* of the reporter, and *Colobotheca albonotata* (*leucospila*, Westw.); *Homonoxa* (p. 319), a new genus, including that of *Urocalymma*, Westw., which name the author has not retained, as it refers to the tail-like prolongation of the elytra of the *H. longimana*, which is not common to all species; *Ichthyodes* (p. 321), a new genus, nearly allied to the preceding, with one new species; *Demodes* (p. 322), a new genus, with one new species; *Pterolophia* (p. 323, 370, 381), a new genus, with ten species; and lastly, a series of species, which are described from specimens so mutilated and faded, that it hardly rewards the describer's trouble. There is also a new generic name, *Microlophia* (p. 383), but without generic characters.

Guérin (Deless. Voy. dans l'Inde, ii. p. 61) has characterized a new genus, *Centrura*, which is allied to *Apomecyna* and *Hutlu*, but is distinguished from them by its ventricose elytra, posteriorly produced into diverging spines; from *Cercoptera*, Spin., by its undilated cheeks, and from *Urocalymma*, Westw., by wanting the tooth on the sides of the prothorax. Perhaps *Sap. lyncea*, Ol., belongs to this genus, which is founded on a new species, *C. costata*, from the Nilgherries. *Pelargoderus tessellatus*, Guér., perhaps belonging to the genus *Agnia*, Newm., if that is different from *Pelargoderus*; *Saperda* (*Sphenura*) *4-notata*, Guér., a *Stibara*, Hope, very nearly allied to *Sap. morbillosa*, F., and *Sap.* (*Sphen.*) *multiguttata*, Guér., are new species from the same mountains (ibid. p. 58-60).

The following new genera belong to the New Holland Fauna:—*Pentacosmia*, Newm. (Entomol. p. 361); a small *Lamia*, with the third and fourth antennal joints greatly elongated, and the fifth bearing a tuft of hair; one spine on the sides of prothorax, and slightly thickened thighs. *Symphyletes* (ibid. p. 362), corresponding in form to *Lam. Solandri*, F. *Zygocera*, Dej., was described by the reporter from its external character (Arch. 1842, i. p. 224); and a new genus, *Illæna*, characterized for a small form of *Saperda*, with simple claws, distinguished by the palpi, the last joint of which is very large and sharp pointed.

Rhytiphora piperita, *tuberculata*, *detrita*, *Hathlia lacteola*, 4-lineata, *lineella*, *melanocephala*, of Hope (Proc. Ent. Soc. p. 49), are new species from Port Essington. *Acanthoderus inglorius*, *Pentacosmia scoparia*, *Rhytiphora mixta*, *caprina*, *Symphyletes nodosa*, of Newman (Entomol. p. 361), are from Port Philip. *Lamia parulalis* of Newman (ibid. p. 414), is from Sydney. *Zygocera canosa* and *Illæna exilis* of the reporter (l. c. p. 223, 225) are from Van Diemen's Land.

I am doubtful concerning the position of the genus *Callipyrga*, Newm. (Entomol. p. 413), with one new species, *C. turrita*? it has rather small eyes, not emarginated towards the base of the antennæ.

Spalacopsis, Newm. (Entomol. p. 303), is a remarkable new American genus. It has the form of *Hippopsis*, but differs in the eyes, which are small and round, and situated on the sides of the head, distant from the base of the antennæ. In this it agrees with *Tetraglenes* (vide supra), only the eyes on the vertex are here wanting. There are three species, *Sp. stellio* from Brazil, *Sp. stolata* and *suffusa* from East Florida.

There are two Austrian *Saperdæ*, *S. (Phytæcia) uncinata* and *biguttata*, Redtenbacher (Col. Aust. p. 25, 26); the second is already described in the first volume of the Bull. Mosc. von Zoubkoff, as *S. bipunctata*.

S. (Phytæcia) cirteensis, *S. (Oberea) maculicollis* and *mauritanica*, Lucas, are three new *Saperdæ* from North Africa (Ann. des Sc. Nat. xviii. p. 187).

In the group of *Lepturidæ*, Mulsant has described the known *Toxotus cinctus* (*Rhagium cinctus*, Fab.), as a new species, under the name *T. dentipes* (Ann. des Phys. publ. p. le Soc. d'Agric. de Lyon, v. p. 109, t. 11, f. 2; Col. de Fr. Lamellicorn. Suppl.)

Hope has noticed *Rhagiomorpha unicolor* and *plagiata* as new species from Port Essington (Proceed. Ent. Soc. p. 49).

Pseudocephalus, Newm. (Entomol. p. 353), is a remarkable new genus, which I mention here at the conclusion of the *Longicornes*, as its position seems doubtful, although the author places it in this family after *Callidium*. The eyes are not emarginated; the antennæ somewhat more than half the length of body, rather thickened towards the point (in the figure they become rather thinner), the first joint elongated; the

head is large and round; the prothorax narrow, tumid in the middle of each side; the legs long, the thighs somewhat club-formed and thickened; the tarsi (in the accompanying woodcut) thin, not at all formed like the tarsi of the *Cerambycidae*. Yet there is as little stated concerning their form as of the palpi. *Ps. formicides*, from Port Philip; $2\frac{1}{4}$ " long; resembling an *Anthicus*.

CHRYSOMELINÆ.—Harris (Ins. of Massachus. p. 95, 109) mentions the following North American species:—*Crioceris 4-lineata*, Ol., lives both as a beetle and larva on the potato plant; the latter covers itself with its excrement like our *C. merdiger*. *Hispa rosea*, Web., (*quadrata*, F.) lives on the apple trees, upon *Amelanchier ovalis* and *Pyrus arbutifolia*. *Hispa suturalis* upon *Robinia pseudacacia*. The larva of *Cassida aurichalcea* lives upon bitter-sweet (*Solanum dulcamara*), and upon different species of bind-weed, especially *Convolvulus sepium*. *Galeruca californiensis* has been introduced from Europe, and increased so much, that the elm trees were eaten bare by their larvæ, at Baltimore, in 1838 and 1839. *G. vittata*, F., is also very detrimental, especially to cucumbers, melons, &c.. *Haltica pubescens* also feeds on the cucumber; and various *Cruciferae* are attacked by *H. striolata* (*Crioc. str.*, F.); and the *H. chalybea*, Ill., is destructive to the vine. The large orange coloured black spotted larvæ and the pupæ of *Chrysomela 3-maculata*, F., live on the *Asclepias syriaca*; and the white larvæ, marked with dark dorsal lines, and square lateral spots, of *Chr. scalaris*, live upon the lime (*Tilia americana*) and elm; *Chr. cœruleipennis*, Say, like our *Chr. polygoni*, from which it can hardly be distinguished, lives upon *Polygonum aviculare*. *Eumolpus auratus*, F., is found upon *Apocynum androsaemifolium*. *Clythra dominicana* upon sumach; *Cl. 4-guttata* upon oaks. *Chlamys gibbosa* upon bilberries. *Cryptocephalus luridus* upon wild indigo; while most of the other species of the last genus live upon the different kinds of oak.

Dr. Schmidt (Ent. Zeit. p. 27) has described a new German *Lema*, *L. Suffriani*; it is most nearly allied to *L. brunnea*, and differs chiefly in the under side of the first two antennal joints, the breast, the knee-joint, and the extreme tip of the claws, being black. There is, however, only one individual (from Erfurt) at present known.

Leptomorpha filiformis, Dej., from Sicily, has been described and figured by Germar (Faun. Ins. Europ. 22. 10).

Gravenhorst and Scholtz have made some observations on the metamorphosis of the *Cassidæ* (Verhandl. der Kais. Leop. Acad. d. Naturf. xix. 11. 431, t. 73). They found, that upon the reflexed fork of the last segment of the abdomen, the rejected skin remains sticking, and that upon this, and not immediately upon the fork, the larva lays its excrement, which serves for its protection. The form of the excrement varies in different species. The larvæ of one species, belonging perhaps to

C. margaritacea, has three cast skins upon the fork, but no excrement. The larvæ of *C. murraea*, *equestris*, *viridis*, and *tigrina*, have also been observed. The larva of a Bengal *Cassida* is figured.

Newman has enriched the genus *Paropsis* (Entomol. p. 414) with ten species, which have been mostly taken at Port Philip, on *Eucalypti*. He has given only short diagnoses, so that most of the species cannot be determined with certainty. Two of them are Fabrician species, viz. :—*P. circumdata*, N., is *Chrys. rufipes*, F.; and *P. fullax*, N., is *Chr. morio*, F. The reporter has described twelve new species of the same genus, from Van Diemen's Land (Arch. 1842, i. p. 226-30).

Matzek has given an arrangement of the Silesian *Chrysomelide* (Arbeit. der. Schles. Ges. für Vaterl. Kultur. 1842, i.), but which only refers to *Timarcha* and *Chrysomela*, in the sense of Dejean. The former contains three, the latter nineteen species: *Timarcha splendens*, Köhler, according to the short description, must be *Chrys. rufa*, Meg., Duft.; *Chr. atra* is certainly not that of Dahl, which is a native of Sicily, but a peculiar and different species, allied to the *Chr. hemisphærica*.

Of the four species described by the reporter from Van Diemen's Land (Arch. 1842, i. 230), two, *Chr. constricta* and *pacifica*, belong to a peculiar New Holland form, which agrees with *Helodes* in the pointed terminal joint of the palpi, and differs by the claws being dentated at the base. The two others, *Ch. luteicornis* and *orphana*, belong to *Phædon*. *Colaspis jugularis*, *C. (odontionopa) viridula*, and *proxima*, of the reporter (ibid. p. 232), are from the same place. *Odontionopa*, Chev., is distinguished from the true *Colaspis*, by two small teeth projecting at the anterior margin of the clypeus (ibid. p. 119).

Saunders has laid before the Entomological Society of London, his researches on the New Holland *Cryptocephali*, accompanied by short remarks, but not sufficient from which to form a judgment, at least in regard to the newly characterized genera, since no notice is taken of some most important points, such as the form of the posterior margin of the prothorax, the scutellum, the insertion of the head, and proportion of the tarsal joints. *Aporocera* is allied to *Clythra* (Proc. F. S. p. 53); antennæ two-thirds of the length of the body, thorax gibbous in front, and as broad as the elytra: *A. bicolor*, and *apicalis*, from New South Wales; *A. chalybea* (ibid. p. 57) from Port Essington. *Mitocera* (p. 54); antennæ one-third as long again as the body, which is sub-elongate and flattened, thorax sub-quadrata: *M. viridipennis*, from Swan River. *Dicenopsis*; antennæ not half the length of the body, the third to fifth joints long, the remainder short, forming a kind of lengthened club: *D. hematodes*, from Van Diemen's Land. *Ochropsis* (p. 56); antennæ as long as the body, joints gradually increasing in size from the sixth, not different from the following, except in its pale colour: *O. vermicularis*, *australis*, *erosa*, *melanocephala*. *Idiocephala* (Ann. Nat. Hist. xl. p. 317, formerly in

Pr. E. S. p. 64, called *Anodonta*); antennæ in the female half as long as the body, sub-clavate, in the male almost the length of body, the joints from the sixth of equal length (in other respects agreeing with our *Cryptoccephalus*): *J. Roei*, *albilinea*, *pulchella*, *cyanipennis*, *flaviventris*, *rugosa* (Pr. E. S. p. 65), *similis*, *tasmanica*, *Darwinii*, *semibrunnea* (Ann. Nat. Hist. p. 317). *Helidomorpha*; antennæ filiform, body long, oval, compressed: *H. atra*, *ænea*, *metallica* (Pr. E. S. p. 65).

The reporter (Arch. 1842, i. p. 119) observed, that the genus *Cadmus* and *Odontoderus*, Dej., were remarkable for their broad soles, formed as in *Cassida*, thickled covered beneath with felt; with the claw joint scarcely projecting beyond the segments of the third joint, but showing no essential difference between themselves; in these, as in *Cryptoccephalus* proper, the mouth is covered by a peculiar hood, formed by the protruding margin of the prosternum, whilst *Pachybrachis*, Dej., which form appears to be unknown in New Holland, possesses the very essential characteristic, that the mouth is not retracted. Another New Holland genus, *Ditropidus*, Chev., Dej., has the posterior margin of the prothorax deeply sulcate on both sides; the middle is protruded between the elytra, the small points being hollowed out for the reception of the scutellum, which is pointed at both ends, and is not elevated. The prosternum forms no projection over the mouth. Neither of these forms is contained among the above genera characterized by Saunders. The reporter has described three new species of *Ditropidus* (ibid. p. 233).

Several new Austrian *Halticæ* have been described by Redtenbacher (Col. Aust. p. 27): *H. (Balanomorpha) circumdata*, *H. (Teinoductyla) nigriceps*, *H. (Aphthona) Campanulæ*. The last, which is nearly allied to *H. euphorbiæ*, is found upon *Campanula rotundifolia*. The reporter (Arch. 1842, i. p. 235) has described *H. (Graptodera) corrusca*, *Psylliodes, chlorophana*, from Van Diemen's Land; and characterized one new genus, *Arsipoda*, which is allied to *Dibolia* and *Psylliodes*, especially by the very strongly thickened posterior thighs, differing from both by the toothed claws; from the former by the simple terminal spine of the posterior tibiæ, from the latter by the eleven-jointed antennæ, and the hinder tarsi articulated to the point of the tibiæ. This genus is peculiar to New Holland. *A. bifrons* is a species from Van Diemen's Land.

EROTYLIDÆ.—Lacordaire's work on this family (Monographie des Erotyliens, Paris, 1842), is a most scientific publication; important from its great richness in species, and also from its systematic divisions. A series of genera, formed merely according to their habit, is here defined in a scientific manner, and often, indeed, with quite different limits. As this indispensable work must certainly be in all hands, I may presume that the author's arrangement is known (vide also Entom. Zeitung. 1843, p. 132), and rather employ my space in making

some remarks on it. The author has introduced a new characteristic, namely, the greater or less convexity of the facettes of the eyes. This presents, indeed, an excellent distinction, and he has found it constant in each genus. Only one striking exception has hitherto occurred to me, viz.,—in the *Ischyryus insignis* the eyes are fine grained, while elsewhere in this genus, and even in the allied *I. venustus*, they are rough. The inner maxillary lobe is armed with two hooks in the *Erotylinæ* proper; I find the same in *Encaustes*, to which the author ascribes a simple tooth on the lobe; and, in fact, this genus, in other respects also, joins most closely to *Aulacocheilus*. On the other hand, a hooked (but not with claw-like hooks, therefore unarmed) inner maxillary lobe is found in the *Triplax aenea*, whilst in *T. russica* it has the usual protruded quadrangular form. *Oocyranus*, with the terminal joint of both pair of palpi equally large, does not appear to me essentially different from *Ischyryus*, where, in the proportions of each terminal joint, many varieties are to be met with, and *O. tarsatus* (from Cuba, not Columbia) completely agrees in the form of the body with the small *Ischyri*, although *O. violaceus* differs a little; the blue colour also is present in *Ischyryus*, and with regard to the generally yellow terminal joints of the antennæ in the *Oocyranus*, upon which the author lays so much stress, the same is also endemic in the West Indian ones, and present in the most different families and genera, even in the *Tenebriones* (for example *Blapstinus*), and is therefore to be disregarded in this point of view. Among the *Erotylinæ* proper, there are several genera only differing in habit (habituellen merkmalen); thus *Erotylus*, *Zonarius*, and *Eurycardius*, agreeing in all other respects, the two latter do not seem to me maintainable as genera. One of the most extensive genera and richest in forms, is *Brachysphenus*, and I agree with the author in placing all the forms in one genus; it is habit only which separates this genus from *Ægithus*, and they may perhaps yet be united. The *Erotylus Buquetii*, Lacord., also appears to me to be a *Brachysphenus*. This family is most difficult to arrange, and we must do justice to the author, to whom the attempts of previous writers were rather perplexing than advantageous, by adding, that he has succeeded in his task in a very remarkable manner. The number of species described is very great, those of Columbia, indeed, surprisingly numerous; the descriptions extremely clear, so that another monograph could scarcely be found which renders its subject so easy, and even, in the present case, without plates.

Dejean has made some observations on the above work (Ann. d. l. Soc. Ent. d. Fr. xi. p. 285), but they do not touch on any thing of importance. I may add here, that Chevrolat (Rev. Zool. 1843, p. 79) has published his remarks on several of the *Erotyli* of Fabricius and Olivier. It is quite correct, that *E. sphacelatus* and *unifasciatus*, F.,

belong to *Spheniscus*; *E. 6-fasciatus*, F., to *Doryphora*; on the other hand, the author is in error when he considers *Er. (Zonar.) indicus*, found so named in the Lund collection, as the real *E. fasciatus*, F.; for first, Fabricius does not appeal to that collection, and secondly, from his description of the parts of the mouth, he appears to have had before him a *Helopia*.

The natural history of the *Triplax nigripennis (russica)* has been described by Leon Dufour (Ann. d. l. Soc. Ent. de Fr. xi. p. 191), the account of the larva is exact. It is curious, that the author will not acknowledge four or five black points in the situation of the eyes, as the organs of sight; he found no labial-palpi (palp. lab. invisibiles). He met with the larva in the *Boletus hispidus*; it goes into the earth to become a pupa, and the nymphæ remained attached to the larva case when burst open. The beetles are frightened by light.

The reporter (Arch. 1842, i. p. 120) places *Engis* in this family; it differs from *Dacne*, *Episcapha*, and *Triplatoma*, only in the first three tarsal joints having no covering of felt beneath. A new genus, *Thallis*, differing from *Engis* chiefly in the membranous lateral portions of the tongue being far protruded, is founded upon three new species from Van Diemen's Land (ibid. p. 237). *Phalacrus brunneus* of the reporter is from the same place (ibid. p. 239).

COCCINELLIDÆ. — *Coccinella frenata*, *Scymnus ventralis*, *discolor*, *stragulatulus*, *Corylophus thoracicus*, *fasciatus* of the reporter are new species from Van Diemen's Land (ibid. p. 239).

ENDOMYCHIDÆ. — The reporter has characterized a new genus, *Daulis* (ibid. p. 241, t. 5, f. 5), which is most closely allied to *Dapsa*, especially agreeing in the form of the antennal club; but the third antennal joint is not elongated, and the last joint of the labial-palpi is strongly thickened; the second tarsal joint is lobed. *D. cimicoides* is from Van Diemen's Land.

LATHRIDII. — Redtenbacher (Quæd. Gen. et Spec. Col. Austr. p. 21) has described a beetle, under the name of *Rhopalocerus ferrugineus*, as the type of a new genus, it is already known under the name of *Monotoma Rondani*, Vill., and for which a peculiar genus, *Spartycerus*, has already been established by Motschoulski, in the Bull. Mosc. 1837. On the remark, that this last name, if correctly spelt, has already been twice employed, Motschoulski altered it to *Apcistus* (Bull. Mosc. 1840, p. 186), a name which requires some improvement before its reception.

Redtenbacher gives an excellent description of the beetle, but I cannot confirm his account of the tarsi being four-jointed; I find only three joints, as in *Monotoma*, to which this genus is nearly allied, although it differs remarkably in the thick antennæ, and the proportion of the joints of the palpi. The small basal joint, which Redtenbacher describes, is perhaps the articulating head of the first joint. Motschoulski

(Bull. Mosc. 1837, v. t. 7, f. 6) draws the three joints quite correctly, although out of proportion, but his account, that the third joint seems composed of two or three, is at all events an error.

Redtenbacher's *Monotoma 4-foveolatum* (Col. Aust. p. 23) agrees with Aube's *M. 4-foveolata*. The latter (Ann. d. l. Soc. Ent. d. Fr. 2, Ser. 1, p. 20, 1843) doubts the correctness of Motschoulski's account, that he had discovered the same insect (1834) in Daghestan, as it was quite new to him when he saw it with Aube (1836). Motschoulski is annoyed that I should have doubted his account (Jahresber. für 1837, p. 208); I only placed the responsibility for it on its author. *Lathridius costatus* of the reporter, is a new species from Van Diemen's Land (Arch. 1842, i. p. 202).

PSELAPHIDÆ.—The reporter has published a species of this family from Van Diemen's Land, *Batrissus australis* (ibid. p. 243). Schaum has discovered a *Bryaxis* in the salt lake at Mansfeld, which he described as *Br. pulchella* (Gené), (Germ. Zeitschr. iv. p. 192), and afterwards (ibid. corrections) he remarked, that it is identical with *Br. Helferî*, Schmidt (Diss. d. Pselaph.)

ORTHOPTERA.

CHARPENTIER has published three new numbers of his "Orthoptera Descripta et Depicta."

Siebold has given a list of the *Orthoptera* (in Latreille's sense) which are found in Prussia (Preuss. Prov.-Blätt. 27 Bd. p. 543). Forty species have been observed by him, viz.,—three *Forficulidæ*, three *Blattæ*, three *Achetidæ*, eleven *Locustidæ*, twenty *Acridæ*. The presence of the *Forficula gigantea* on the sea-coast of the low ground at Danzig, from whence it was sent to our collection by Professor Grube, is deserving of notice. The author gives a very graphic account of the chirping of the *Acridæ* and *Locustidæ*. The scraping of the hind legs of the former against the floor has been observed not merely in *Gomphoceris*, where each species has its own peculiar way of doing it, so that the individual species are easily recognised by their chirping; but also in *Ædipoda* and *Tetrix* (the latter, perhaps, moving the under wings). In the *Locustidæ*, the author shows, that the chirping is accomplished by the strong ledge-like rib of the inner margin of one elytron being rubbed up and down on the crenated transverse ledge of the drum of the other (under one).

A very important treatise has appeared: "Bijdragen tot de Kennis der Orthoptera, door Dr. W. De Haan." It is also contained in the Verhandel. o'er de Natuurl. Geschied. der Nederlandsche overzeesche

Besittingen, Zool., Nos. 6, 7, 8, 9. In these numbers, the families *Blattæ*, *Mantidæ*, *Phasmidæ*, *Acridæ*, and *Locustidæ*, are completed, and that of the *Achetidæ* commenced. The number of species described and figured is great, and many of them are new; American and African species are also added, and those of Japan are arranged in order, according to their agreement with those of the Netherland's India. The author has paid great attention to the geographical distribution. With regard to system, we may remark, that he considers the families named as genera, and the newer genera only as sub-divisions and groups; therefore, when he could characterize new ones, he does not name them, although they are fully defined.

The reporter (Arch. 1842, i. p. 244) has described a number of species from Van Diemen's Land, and, at the same time, drawn attention to the preponderance of apterous species in that fauna. About one half of them showed neither traces of elytra nor under wings; a fourth had elytra but no under wings, and most of these were only stumps; and only one-fourth of the species was completely winged, and capable of flying.

FORFICULIDÆ.—The reporter has described two new species of *Forficula* from Van Diemen's Land (ibid. p. 246). The one, *F. ruficeps*, without under wings; the other, *F. pacifica*, also wanting the elytra.

BLATTIDÆ.—De Haan (l. c. sup.) has described as new, among the *Blattæ* of the Netherland's India, the following:—*Periplaneta zonata*, Hagenb., *flavicincta* and *concinna*, Hagenb., from Java; *Epilampra macassarensis*, from Macassar; *Nauphaeta bilunata*, from Java; *N. circumdata*, from Sumatra. De Haan, in his division, has paid attention principally to the absence and the proportionate length of the wings; the reporter (Arch. 1842, i. p. 245) has, on the other hand, shown, that like most of the *Orthoptera*, here also winged and wingless species occur in the same genus, as Serville very correctly states. Of the new species from Van Diemen's Land (ibid. p. 247), *Periplaneta melanaria*, *atrata*, and *aterrima*, are completely destitute of wings and elytra, as well as *Blatta trivittata*, which approximates the *Bl. decipiens*, Germ. *Bl. marcida* has wings.

Sells (Transact. Ent. Soc. Lond. iii. p. 103) has described the eggshells of several *Blattæ* from Jamaica.

MANTIDÆ.—De Haan has described and figured many new species (l. c. s.): *Mantis valida*, Hagenb., from Timor and Amboyna; *basalis* and *flava*, from Java; *timorensis*, from Timor and Amboyna; *herbacea*, from Japan; *novæ-guinææ*, from New Guinea; *trifasciata*, from Brazil; *bifasciata*, from Cuba; *heteroptera*, *Servillei*, and *torticoides*, from Java. *Oxypilus* (the author divides this as a sub-genus from *Mantis*, because the species are less than 1" in length; in the *Mantis* they are longer; there are, however, other characters, especially the number of

spines on the anterior thighs): *phyllopus* and *punctata*, from Java; *lobiceps*, from Sumatra; *bicingulata*, *crassipes*, *reticulata*, and *planiceps*, from Java and Borneo. *Harpax sumatrana*, from Padang. A new group resembling *Oxyphilus*, but having lobes on the posterior thighs: *M. oligoneura*, from Sumatra, Java, and the Moluccas; *M. borneensis*, from Borneo. *Blepharis Kuhlîi*, *Thespis thoracica*, and *armata*.

Charpentier (Orth. Desc. No. 5) has figured *Vates macropterus* (Mant. macr., Stoll., Mant. lobipes, Licht., *V. macropt.* and *orbis*, Burm., Theoclyt. lobipes, Serv., *Empusa lobipes*, Griff.); *Mantis concinna* (♂, *M. oratoria*, De Geer, *M. aurantiaca*, Burm., *M. 4-maculata*, Serv.; ♀, *M. concinna*, Perty, Serv., *M. tricolor*, Burm.); *Mantis annulipes*, Serv., *Acanthops sinuata* (Mant. sinuata, Kirby, *A. mortuifolia*, Serv. (?); the author considers *M. sinuata*, Stoll. (?), *M. angulata*, Licht., *A. erosa*, Serv. (?), *A. fuscifolius*, Burm., as its ♀); and *A. tessellata*, a male similar to that of the preceding, the female of which is not yet known, found in Brazil.

Westwood (Arcana Ent. i. p. 161, t. 41) has figured a new and very distinct species of the genus *Toxodera*, Serv., which differs from Serville's species by the points of the eyes being obliquely directed forwards (in both without facettes), and very slightly lobed posterior thighs; therefore he gives it a peculiar sub-generic name, *Heterochaeta*. The particularly large species, *T. (H.) tenuipes*, comes from Senegal.

De Haan (l. c. s.) has reduced the genus *Deroplatys*, Westw. (*Chœradodis*, Guér.), to two species, as he unites *D. arida*, Westw., as ♂, with the *D. lobata*; and the ♂ figured by him, the *D. rhombica*, Hagenb. (*desiccata*, Guér.), appears to agree with *D. angustata*, Westw. On the other hand, Guérin (Deless. Voy. dans l'Inde, ii. p. 65, t. 15) has enriched this genus with a distinct new species, *Chœradodis truncata*, from Singapore.

SPECTRA.—The new species of this family, described and figured by De Haan, are as follows (l. c. s.):—*Heteropteryx* (Gray) *Mülleri*, from Sumatra; *Phyllium celebicum*, from Celebes; *Prisopus* (*Platytelus*) *Horstokii*, from the Cape of Good Hope; *Ascephasma* (*Perlomorpha*) *Forstenii*, from Celebes; *Creoxylus flavicornis*, from Borneo, *affinis* and *viridimarginatus*, from Java; *Xeroderus laceratus*, from Sumatra; *Necrosia* (*Platycrania*, Gr.) *acanthocephala*, *spiniceps*, and *diacanthos*, from Java, *fuscoannulata*, from Borneo, *nigroannulata*, from Java, *sordida* and *pulchella*, from Sumatra, *rubicunda* and *jularis*, from Java, *nigrofasciata*, from Sumatra; *Phasma conocephalum*, from Sumatra, is a distinct unnamed form, with wings as long as the abdomen, elytra one-fourth of the length of the wings, and a short dilated abdomen; in the ♀, the vertex is elongated into a cone directed backwards. *Tropidoderes Bojei*, from Macassar; *brachypterus*, from Sumatra; *Maclottii*,

from Java; *galapterum*, from Sumatra; *Haplopus bicuspidatus* and *bituberculatus*; *Cyphocrania Reinwardtii*, from New Guinea; *Cladoxera Diardi*, from Java; *Bacteria nematodes*, from Java; *nodosa*, from Sumatra; *niponensis*, from Japan; *Acanthoderus japonicus*, from Japan; *noli-me-tangere* and *phyllopus*, from Java; *bifolius*, *verrucosus*, from Sumatra; *Pachymorpha coronata*, from Java and Amboyna; *Bacillus javanus*, from Java.

Charpentier (Orth. Desc.) has figured *Cladoxerus phyllinus* (♂, *Phibalosoma Lepelletieri*, ♀, *Cladomorpha phyllinus*, Serv.), from Brazil; and *Phasma vinosum* (*Necrosia vin.*, Serv.), from Borneo.

ACHETIDÆ.—Ratzeburg (Ent. Zeit. p. 267) has drawn attention to a sexual distinction in the abdomen of the Mole-cricket (*Gryllotalpa vulgaris*); in the male, all the eight abdominal segments are formed pretty much alike, while, in the female, the last two are remarkably small, and the penultimate appears to be slightly shortened, towards the sides, into a semicircular form, in the living animal. The author farther remarks, that the female watches her eggs after having laid them.

The reporter (Arch. 1842, i. p. 249) has described a Mole-cricket from Van Diemen's Land, *Gryllotalpa australis*, which is distinguished by the want of under wings in the male.

Harris (Ins. of Massachus. p. 122) mentions three species of *Acheta*, in Massachusetts, living in the open air:—*A. abbreviata*, identical with Serville's of the same name; *A. nigra*, wholly black, with very short or rudimentary wings; 6''' long; *A. (Nemobius) vittata*, 3-4''' long, with only the stumps of tegmina; dusky brown, sometimes passing into black; three black stripes on the vertex, one on the sides of the prothorax, passing on to the tegmina, which are generally lighter coloured; the posterior thighs have three rows of oblique black stripes on the outside. They are found in company, in the day time, on the meadows and roads.

LOCUSTIDÆ.—Numerous species have been described, and partly figured by De Haan (l. c. s.):—*Hetrodes cervina*, Kl., from the Cape. *Ephippigera trilineata* from Tripoli; *varicornis*, Kl., from Syria; *L. bicolor*, a peculiar apterous form, from Sumatra. *L. novæ-guinæ*, also a peculiar form. *Xiphidion stramineum*, Kl., from Egypt; *longipennis* from Sumatra; *lepidum* and *melænum*, from Java. *Phaneroptera chloris*, *poæfolia*, and *parumpunctata*, from Java; *triticeifolia* from Borneo; *adusta*, from New Guinea; *celebica*, from Celebes; *quinquennervis*, from Java and Japan (*falcata* is also cited from Japan); *caricifolia*, from Borneo; *pilipes*, from Japan; *trichopus*, from Java; *ensis*, from Borneo and Japan; *loliifolia*, from Java; *hordeifolia*, from Timor; *8-seriata*, from Java. *Phylloptera crassifolia*, and *nitidifolia*, from Java; *Forstenii*, from Celebes; *retifolia* and *curinata*, from Java. *Pseudophyllus crenifolius*, from Borneo; *novæ-hollandiæ*, from Sumatra and Port Jackson. *Aprion arcifolia*, from Sumatra; *ampullacea*, from Java and

Sumatra; *rubro-marginata*, from Borneo; *lobifolia*, *fuscescens*, and *brevifolia*, from Java. *Gnathoclita*, Hagenb., a new form founded on *L. vorax*, Stoll., differs from *Anostostoma*, by the broad soles of the tarsi, from *Listrosceles*, by the short spines of the anterior tibiæ and the not-elongated maxillary-palpi; it seems to be more nearly allied to *Prochilus*, Brull. *Saga minuta*, from the Cape. A peculiar unnamed group, which has narrow tegmina, rounded wings of the length of the abdomen, chink-like openings on the anterior tibiæ; a large head, with the vertex produced forwards, the prothorax truncated posteriorly, prosternum with two spines, and the ovipositor long, narrow, and curved, includes *L. megacephala*, from New Guinea, and *L. laticeps*, from Amboyna. *Conocephalus cuspidatus*, Kl., from Brazil; *acanthocerus*, of which the native country is unknown; *macro*, from Amboyna; *planispina*, from Java; *crassiceps*, from Japan. *Decticus Bürgeri*, from Japan. *Locusta loboensis*, from New Guinea; *sumatrana*, from Padang (*viridissima* is also found in Japan). *Raphidophorus marmoratus*, *cubaensis*, from Cuba. *Gryllacris phryganoides*, from Java; *fumigata* and *Servillei*, from Borneo; *podocausta*, from Java.

The reporter has noticed (Arch. 1842, i. p. 249) three new species from Van Diemen's Land; two of them, *Agræcia lateralis*, and *Xiphidium bilineatum*, have stumps of tegmina; the third, *Gryllacris ambulans*, is completely apterous.

Adam White (Gray's Zool. Miscell. ii. p. 78) has described a remarkable new form from New Zealand, under the name of *Deinacrida heteracantha*. He thinks it must be an *Anostostoma*, Gray; the arming of the breast, the two strong spines of the prothorax, and two strong teeth of the excavated mesothorax and metathorax agree with that genus, the mandibles are much shorter, the labial-palpi thickened at the point, the maxillary-palpi very long, the last joint slightly thickened at the point, the antennæ twice and a half, and the hinder legs twice as long as the body; the posterior tibiæ quadrangular, the angles armed with very sharp spines placed alternately; the body brown above, yellow beneath.

Harris (l. c. s. p. 126) mentions, among the species found in Massachusetts:—*Raphidophora maculata* (*Gryllus maculatus*, Harr. Catal. of Ins. of Massachus., which is apparently identical with *Phalangopsis lapidicola*, Burm.) living among stones and rubbish; *Platyphyllum concavum*, Harr., in the Encycl. Amer. vol. viii., is, as the author reasonably conjectures, *Loc. perspillata*, F.; *Platyphyllum persp.*, Serv.; *Cyrtophyllus persp.*, Burm. Harris distinguishes a species allied to the *Phaneroptera oblongifolia* (*Locusta obl.*, De Geer), as *Ph. angustifolia*, by the narrower tegmina and much shorter and stronger curved ovipositor of the female. *Orchelimum agile*, Serv. (*Locusta ag.*, De Geer), is not found in Massachusetts; but there are two new species:—

O. vulgare, allied to the species above mentioned; but it differs in the tegmina being as long as the under wings, and the male having two black spots upon them; it is very plentiful in the meadows: *O. gracile* is like the preceding, but smaller (its length to the tip of the wings is 7-8"), the wings projecting a little from beneath the tegmina, and the male having no black spots upon them. Lastly, a species of *Conocephalus*, which is mentioned in the Catal. of Ins. of Massachus., under the name of *ensiger*, and appears to the author to be different from *C. dissimilis*, Serv.; it is green, with a whitish head, and has the mark of a U under the tooth, which is directed downwards to the cone on the forehead, the ovipositor of the female is straight, and above 1" long, the length to the tip of the tegmina $1\frac{3}{4}$ -2".

Charpentier (l. c. s.) has figured both sexes of *Phaneroptera macropoda*, Burn. (*dulmatina*, Serv.); *Ph. cruenta*, Burm., and a new German species, *Locusta caudata*, resembling the *L. viridissima*, but smaller, and with a longer ovipositor, and without the brown stripe on the head and prothorax, or the brown on the inner base of the tegmina, and having a black spine on the posterior thighs.

The *Locustæ* occurring in Denmark have been arranged by Schiödte (Krøyer Naturhist. Tidsskr. iv. No. 3, p. 316). There are seven species.

Siebold read his observations on the spermatozoa of the *Locustidæ*, at the meeting of Naturalists at Mainz (1842). They are of a peculiar form, consisting of a long flat body, which gradually passes into a long very tender thread, terminated by a V-shaped appendage. This, as well as the body, is stiff; but the threads are very flexible. In the simple receptaculum seminis of the female *Locustæ*, after copulation, the seminal mass is found to be contained in several bags; in these are observed peculiar filiform bodies, winding round each other with undulating motions. On minute examination, it was discovered, that these filiform bodies were composed of the spermatozoa, which attach themselves to each other by the V-shaped appendage. (Amtl. Bericht, &c. p. 223.)

ACRIDITES.—Charpentier (l. c. s.) has enriched this family with one new genus *Sphenarium* (Fasc. vi. t. 31), most nearly allied to *Pyrgomorpha*, by its oblique face, with the top of the forehead projecting forwards, fourteen-jointed antennæ and large claws on the hinder tarsi, but apterous, with small narrow stumps of tegmina, and a short thickened body, fusiform in the middle; *Sph. purpurascens* is from Mexico (a whole series of nearly allied species of this excellently conceived genus, and all from the same country, are preserved in the Berlin collection). Charpentier has also figured *Tropinotus discoideus*, Serv. (t. 32), and *Acridium tarsatum*, Serv. (t. 22), both from Brazil; *Eremobia muricata*, Gryll. *muricatus*, Pall. (t. 23), from the south of Russia; and *E. limbata* (t. 24), a new species from Turkey.

Westwood (Arcana Entom. i. p. 66, t. 17) has figured a gigantic new species of *Opsomala*, *O. gigantea*, from Sierra Leone [*O. gladiator*? Westwood has published no insect under the name of *O. gigantea*, and *O. glad.* is on the same plate with *Bactrophora*], with a new genus, *Bactrophora*, which has a short obtuse tooth on the prosternum, a large head with a strong staff-like process on the forehead, twenty-four-jointed antennæ a little compressed and articulated to the base of the process of the forehead, between and near the large projecting eyes, short fore-legs; *B. dominans*, $3\frac{1}{2}$ " long: native country unknown.

Westwood (ibid. p. 99, t. 26) has given a monograph on the genus *Mastax*, Perty, which approaches *Proscopia* by its ascending head, and the fewer (perhaps only thirteen) jointed antennæ. To the South American species, made known by Perty and Serville, he adds three East Indian:—*M. apicalis*, from Sumatra; *M. vitrea*, from Java; *M. guttata*, from Sumatra and the Philippine Islands.

Among the numerous *Acridiæ* described by De Haan (l. c. s.) are the following new species:—*Truxalis psittacina*, from Java. *Opsomala bicolor*, from Java and Japan; *teniata*, from Java. *Pyrgomorpha chloropus*, and *hæmatoptera*, from Java; *novæ-guineæ*, from New Guinea and Borneo; *brachyptera*, from New Guinea. *Trigonopteryx punctata*, from the Cape of Good Hope. *Acridium consanguineum*, from Macassar; *Hagenbachii*, from Java. *Oxya obtusa*, from Java; *infuscata*, from the Sunda Islands; *dimidiata*, from Amboyna; *affinis*, from Sumatra; *microptera*, from Java; *unistrigata*, from New Guinea. *Acridium macula-lutea*, from Sumatra, forms a peculiar type between *Oxya* and *Ædipoda*, with a horned prosternum. (*Ædipoda subfasciata*, from the Island of Samu, near Timor; *caliginosa*, from the Cape of Good Hope; *vulnerata*, from Java; *4-maculata*, from the Cape. *Mastax agrionoides*, from Borneo and Sumatra; *cycloptera*, from Java; *crenata*, from Borneo. *Hymenotes arcuatus*, from New Guinea. *Tetrix cornuta*, *phyllocera*, and *hexodon*, from Java; *cephalica*, from Sumatra; *gracilis* and *dilatata*, from Java; *gibbosa*, from Japan; *brevis* and *emarginata*, from New Guinea.

Of the reporter's five species from Van Diemen's Land (Arch. 1842, i. p. 250), *Truxalis viatica* and *Mesops pedestris* are completely apterous; *Acridium ambulans* has stumps of tegmina but no wings; *Calliptamus bajulus* and *Tetrix argillacea*, have the wings perfect but rather short.

Harris (Ins. of Massachus. p. 132-155) has added many new species of this family:—*Acridium alutaceum* is dark yellowish-brown, with a pale yellow dorsal line upon head and prothorax; a slightly elevated keel; tegmina semitransparent and with irregular brown patches; wings transparent and colourless, but with a network of dark yellow; the abdomen has transverse rows of small blackish patches; the posterior tibiæ reddish, with yellowish white spines having black points; $1\frac{3}{4}$ " long.

Acrid. flavovittatum; olive-brown, with a yellow stripe on each side from the forehead to the points of the tegmina; the posterior tibiæ and tarsi blood-red with black pointed spines; it appears to be identical with *Caloptenus femoratus*, Burm., and is very hurtful to gardens. *Locusta (Edipoda) corallina*, is perhaps identical with *Æ. phænicoptera*, Burm. *L. maritima*; ash-grey, the face spotted with white; the tegmina minutely spotted with brown, semitransparent at the point; wings pale yellow at the base, with a band of blackish spots in the middle; posterior tibiæ pale, with black tipped spines; $\frac{3}{4}$ –1 $\frac{1}{4}$ " long; very abundant, but only near the coast. *L. æqualis*; wings bright yellow as far as the middle, then having a broad black band; posterior tibiæ coral-red, with a white ring under the knee; $1\frac{1}{4}$ " long. *L. lutipennis*; wings broad, their lower half bright yellow, then dark, with a regularly spotted band in the middle; posterior tibiæ bright yellow, with a black ring under the knee, and a broad black tip. *L. marmorata*; grey, marbled with yellow and black; the lower half of the wings yellow, the middle having a broad black band, and the point two black patches; posterior tibiæ coral-red, having a black, then a white, and sometimes again a black ring under the knee, and a black point; 7–9" long. *L. eucrata*, allied to *Æ. fenestralis*, Serv., but the wings are yellow, not red at the base. *L. nebulosa*; wings transparent, with dark tips and a dark brown stripe on the anterior margin; posterior tibiæ brown, with a broad white ring under the knee; 8–12" long; very common. Harris distinguishes a sub-genus, *Tragocephala*, by the antennæ, which are shorter than the prothorax, and slightly thickened towards the point, the more oblique face and the mouth placed nearer the breast. It includes *Acr. viridi-fasciatum*, De Geer (*Gryll. virginius*, F., *chrysomelas*, Gm., *Acr. marginatum*, Ol., *hemipterum*, Pall., Beauv.); and two new species: *Tr. infusata*; dusky brown; prothorax finely keeled; tegmina slightly spotted with brown; wings transparent, pale greenish-yellow at the base, with a large dusky cloud towards the middle of the posterior margin, and a black stripe on the anterior; posterior tibiæ brown with a broad whitish ring under the knee; length $\frac{3}{4}$ "; on the pasture lands of Massachusetts from May to the end of July. *Tr. radiata*; nut-brown; prothorax keeled above; tegmina wholly brown but transparent at the tips; wings transparent, netted with brown and with black longitudinal veins slightly green at the base, a large dark cloud in the middle of the posterior margin, and a brown stripe on the anterior; posterior tibiæ reddish-brown, somewhat paler under the knees; length above 1"; rare in Massachusetts and North Carolina. A second sub-genus, *Chloëaltis*, with a still more oblique face, longer antennæ, a depression in front of each eye for the reception of the first antennal joint, prothorax without a keel, almost truncate posteriorly, and very short wings and tegmina; might be arranged under

Gomphocerus. It contains three new species; *L. Chl. conspersa*; reddish-brown spotted with black, a black stripe upon the head behind each eye, and continued along each side of the prothorax; tegmina rather oblong-oval, bright yellowish-brown, with small dark brown patches; wings $1\frac{1}{2}$ " long; posterior tibiæ pale red; almost 1" long. *L. Ch. abortiva*; brown; tegmina spotted, with black covering two-thirds of the abdomen; posterior tibiæ coral-red, whitish under the knee. Both found on the pasture lands in July, and distinguished only by the colour. *L. Ch. curtipennis*, nearly allied to the *G. parallelus*, Zett.; tegmina in the male as long as the body; wings somewhat shorter. Among seven species of the genus *Tetrix*, five are new, namely:—*T. dorsalis*, *4-maculata*, *bilineata*, *sordida*, and, with *T. ornata*, Say, belong to the division with fourteen-jointed antennæ, the point of the head projecting before the eyes, and the prothorax elongated over the end of the abdomen; but as these species only differ in colour, it is possible that they may, some of them, be only varieties of each other; the two other species belong to the division with twenty-two-jointed antennæ: *T. lateralis*, Say, with longer prothorax, and *T. parvipennis*, a new species, differing from the preceding by the prothorax not being prolonged over the end of the body, and its much shorter wings.

TERMITINA.—Guérin has remarked, concerning the sexes of the *Termites* (Rev. Zool. p. 278), that the males are as yet wholly unknown; for although Burmeister has characterized the female as entirely apterous, and all the winged individuals as males, yet he has convinced himself, by the anatomical examination of a great number of them, that every winged termite is not a male, but may be a young female. Those which are called workers Guérin holds to be female larvæ, those called soldiers he thinks must be male larvæ. He is certainly right, when he considers the apterous termites as females, for the greater number belongs to that sex; but there are some among the winged individuals, which, by attention, can be distinguished from the common ones, and which are, to all appearance, males. Observation alone can show what becomes of the soldiers; all assumptions on this point appear to me to be mere conjecture.

PERLARIÆ.—The comprehensive and complete monograph on this family by Pictet, "Histoire Naturelle générale et particulière des Insectes Neuroptères, Famille des Perlides. Genève et Paris, 1841, 8vo., pl. 53," is now completed. The near relation of these insects to the *Orthoptera* has not escaped the author, and he has very nearly (without knowing my opinion), of his own accord, determined to unite them to that order (p. 99). The earlier states have been examined with particular care; the anatomical relations have also been regarded, without, however, studying them in a very minute manner. Their great similarity in this respect to the locusts, is striking; but there are considerable

variations; *Perla bipunctata* has, in the intestinal canal, a ring of eight blind sacs at the end of the stomach, a cæcum, and numerous gall vessels; in other species the number of the latter is less; in *Chloroperla* the blind sacs are small, and reduced to six in number, the cæcum is wanting, and the gall vessels are only twenty, and much shortened; in *Nemoura* the blind sacs are wanting, and the gall vessels are still fewer. Similar variations occur in the form of the under lip, as the parts pointed out by me as lobes, appear to vary in their extent of development.

Pictet has had the advantage of a very great supply of species, so that this formerly small family has now arrived at considerable size. Twenty-eight of the species described are still unknown to him; the number of those examined by him amount to 100, of which nearly two-thirds are new. Of these 100 species, twenty-seven are spread over a great portion of Europe; nine are peculiar to Switzerland, six to the north, and nine to the south of that country. There are two Egyptian species; eight from Asia, viz.,—one Siberian, one from the continent of India, two from the Sunda Islands, four from Japan. There are two species from New Holland. America has, in all, thirty-seven, viz.,—seventeen from the United States, five from Mexico and Columbia, three from Chili, ten from Brazil, and two inhabit a great part of that continent.

Pictet recognises six genera, which are partly divided into sub-genera.

I. *Kollaria*, new genus, with setaceous very long maxillary-palpi, a very large projecting external maxillary lobe, small mandibles, and large netted and veined wings. One species of considerable size, of which the native country is unknown.

II. *Pteronarcys*, Newm., netted and veined wings, short setaceous maxillary palpi, of which the second, third, and fourth joints, are dilated externally. *Pt. proteus*, N., and *Perla reticulata*, Burm., and *Pt. thalia*, *regalis*, and *biloba*, Newm.

III. *Eusthenia*, Westw., strong netted and veined wings, moderately long simple setaceous maxillary-palpi. *E. spectabilis*, Westw., from the Swan River.

IV. *Perla*, Geoffr., simply veined wings, setaceous palpi. Contains the following sub-genera:—1. *Dictyopteryx*; the terminal part of the sub-marginal space crossed by transverse nerves; the longitudinal nerves there are often irregular, the wings rounded, the head small: *P. microcephala*, Pict.; and five new species.—2. *Nephelion*; the terminal part of the sub-marginal space without transverse nerves; but the branch of the sub-marginal nerve ramifies considerably, and is irregular: *Isogenus nubecula* and *frontalis*, Newm., and two new species.—3. *Acroneuria*; wings elongated with the terminal part of the sub-marginal space crossed by transverse nerves; and the longitudinal nerves are irregular; head broad; mandibles with one tooth: one new species, *P. arenosa*, from North America, which perhaps may be united to *P. abnormis*, Newm.—

4. *Perla*; the terminal part of the sub-marginal space has no transverse nerves, and the branch of the under rib without ramifications, or with one or two regular bifurcations; the marginal cell, at the point, has at least two transverse nerves: *P. bigunctata*, *marginata*, and in all forty-two species, which are divided into seven groups, chiefly according to colour.—5. *Chloroperla*, Newm.; differs from *Perla* in the marginal cell at the end being without transverse nerves, or only having a single one: *P. virescens*, Pict.; *rufescens*, *venosa*, Steph.; and three new European and three exotic species.—6. *Isopteryx*; small species; almost wanting the anal space of the posterior wings: *P. flava*, Fourcr.; *apicalis*, Newm.; and in all seven species.

V. *Capnia*.—Filiform palpi, long anal setæ; with two sub-genera:—1. *Capnia*; without transverse nerves at the end of the wings: *P. nigra*, Pict.; *Sembl. pygmaea*, Burm.; and one new species.—2. *Gripopteryx*; with numerous transverse nerves at the end of the wings: *Sembl. gracilis*, Burm., and one new species, from Brazil.

VI. *Nemoura*.—Filiform palpi, small or rudimentary anal setæ; with three sub-genera:—1. *Tenopteryx*; antennal joints of equal size, rudimentary 3-jointed anal setæ: *N. nebulosa* (*Phryg. neb.*, Lin.), *trifasciata*, Pict.; in all six species.—2. *Leuctra*, Steph.; second tarsal joint very short; scarcely any anal setæ; wings narrow, rolled together, so as to be semi-tubular: *N. cylindrica*, De Geer, &c.; in all, seven species.—3. *Nemoura*; wings usually lying flat, the nerves of the parastigma forming an χ , which is not the case in *Leuctra*, with which this sub-genus agrees in its other characters: *N. variegata*, *cinerea*, Ol.; in all, eight species. All those species are figured which are known to the author from personal observation.

Lepismenæ.—Gervais (Ann. d. l. Soc. Ent. d. Fr. xi. p. 47) has published a new genus under the name of *Nicoletia*, having an oblong somewhat compressed scaleless body; thorax scarcely so broad as the abdomen, the three segments pretty equal; three moderately long setæ at the extremity of the abdomen; the branchial legs on the abdomen very distinct. *N. geophila* and *phytophila*; the one found in hot houses, the other in the woods around Paris.

NEUROPTERA.

Loew has published some excellent observations on the anatomical relations of the *Neuroptera*, as at present limited. (Germar's Zeitschr. iv. p. 423.)

The insects formerly referred to *Neuroptera*, with incomplete metamorphosis, which I have united to the *Orthoptera*, also agree, in their

internal structure, in a striking manner, with the *Orthoptera* proper. The other *Neuroptera* are essentially different, particularly in the number of the gall vessels, of which eight at most are found, and in the separation of the two last plexus of nerves, which in the *Orthoptera* are joined together. In the internal structure, as well as in other respects, the three primary divisions of the *Neuroptera* differ considerably from each other. The *Panorpates* are distinguished by the thin bag-like appendages of the genital organs, which, in the *Hemerobii*, are small and like pustules; both agree in the simple receptaculum seminis, also in the form of the ovaries, which contain pectinated egg-tubes, in the compressed form of the testicles, the proportionably great length of the vasa deferentia, and the extraordinary shortness of the ductus ejaculatorius; in this last point the *Phryganeæ* also agree, though widely different in other respects. The author explains the appendages which open into the ductus seminis as seminal bladders; the contents of these generally long and bag-shaped vessels confirm this opinion, as they correspond to the appendages, generally in pairs, which open into the ductus ejaculatorius.

HEMEROBII.—Lefebvre (Guér. Mag. d. Zool. Ins. pl. 92) has described and figured a new and distinct species of *Ascalaphus*, *A. Napoleo*, from Swan River, in New Holland, and at the same time given an arrangement of the genus. He proposes to arrange it as a group, under the name of *Ascalaphides*, which will include two sub-divisions,—*Ophthalmi* and *Schizopthalmi*. This distribution into genera is as follows:—

I. *Ophthalmi*.—The anal-nippers in the male sometimes visible, sometimes invisible: in the former case the wings either have an appendage, as in *Ptynx* (*costatus*, Burm.), or have not, as in *Azesia* (*Napoleo*, v. s.) In the latter case the wings are not appendaged as in *Amœa* (*sub-costatus*, Burm.)

II. *Schizopthalmi*.—The anal-nippers in the male are sometimes visible, sometimes invisible. In the former case they are partly projecting, either with lateral lobes at the anus, in the female, as in *Deleproctophylla* (*australis*, Lefeb.), or without them, and the anal nippers in the male strong, as in *Proctarrelabis* (*hamatus*, Kl., *capensis*, F., *annulicornis*, Burm.; in the first the anal nippers are forked, in the others simple; a new species differs from this latter, by the wings being repand at the inner margin), slight and simple as in *Ascalaphus*, with the hinder wings dilated at the inner margin (*A. italicus*, F., *longicornis*, *ictericus*, Charp. &c.), and as in *Hybris*, with undilated hinder wings (*javanus*, Burm.) The anal-nippers are situated partly at the end of the abdomen, as in *Acheron* (one new species), with the wings projecting over the abdomen, and antennæ dentated at the base, on the inside. In the other case (anal nippers of the male not visible), the wings are either appendicled, as in *Orphné* (*appendiculatus*, F.), or not, as in *Suhpalacca*

(where the wings and antennæ show many variations, the wings are : *a.* Constricted at the base, as in *macrocerus*, Burm., with the antennæ longer than the wings, and a new species in which they are scarcely so long as the wings : *b.* Simple, as in *MacLeayanus senex*, Burm., *4-punctatus*, Burm., *flavipes*, Leach and others : *c.* The hind wings dilated and more or less repand at the inner margin, as in *versicolor*, with the antennæ longer ; and *surinamensis*, F., and others, with the antennæ of the same length, or shorter than the wings.) Finally, the genus *Puer* (*niger*, Borkh.), differing by a very wide net-work on the wings.

However much the profoundness of this division may be acknowledged, yet I cannot withhold my objection, that a part, which like the male anal-nipper, is differently formed in almost every species, should be used primarily for founding genera, the very nomenclature of which is also, for the most part, objectionable.

A new *Mantispa*, *apicalis*, from Rhodes, has been described by Loew (Germ. Zeitschr. iv. p. 433). A new genus, *Psychopsis*, Newman (Entomol. p. 415), has the following diagnosis :—"Generi *Chrysopa* affinis, at alarum nervuris aliter dispositis." The species, *Ps. mimica*, from Adelaide, in South Australia, is certainly very distinctly represented on the title-page, yet not so that the generic characters can be made out from it.

Lastly, I may mention here an insect, described by Westwood as inhabiting the *Spongilla fluviatilis* (Trans. Ent. Soc. iii. p. 105, t. 8). It may be best compared with the larva of *Hemerobius* ; the antennæ are long and setaceous, four bristles project from the mouth as far as the antennæ, approximating in pairs, one stronger and one finer, they represent mandibles and maxillæ ; the palpi, upper lip, and tongue are wanting. The first seven segments of the abdomen have, on the under side, each a pair of jointed flat appendages, which are evidently branchiæ, as two vessels are easily observed in each of them. He is in doubt to which order this insect may belong ; he is most inclined to suppose it a neuropterous larva ; however, there is a possibility that it may be the larva of *Acentropus*. From its very near alliance to the larva of *Hemerobius*, I have no doubt that it belongs to an insect of this family ; the chief distinctions of the species are, indeed, conditional on their abode in the water. Similar organs of respiration are also found in *Sialis*, but this larva stands much nearer *Hemerobius*, and so I may conjecture, that it is that of *Sisyra*, Burm. Westwood, on the supposition that it is a perfect insect, has given it the name of *Branchiotoma spongillæ*. (See a paper by Grube, in the Arch. Naturgesch. 1843, i. p. 331, t. 10.)

HYMENOPTERA.

SIEBOLD has published his researches on the Receptaculum Seminis of the female *Hymenoptera*. (Germ. Zeitschr. iv. p. 362, t. 2.)

There are two principal types shown in the formation of this part, which agree with the two chief divisions of the *Hymenoptera*, according to the form of the larvæ. In the first type, the receptaculum seminis is distinguished by a ductus seminalis, a capsula seminalis, and a glandula appendicularis. There were examined,—1. *Formicidæ*, where the parts in question are disproportionally large; 2. *Apidæ*, where they are found in the working bees in a very undeveloped condition; 3. *Andrenidæ*; 4. *Vespidæ*, where, in the workers, these parts are found more distinctly formed than in the working bees—even in the *Polistæ* the workers are only distinguished from the egg-laying females, by the empty ovary and receptaculum seminis; 5. *Scoliadæ*; 6. *Mutillidæ*; 7. *Crabronidæ*; 8. *Bembecidæ*; 9. *Chrysidæ*; 10. *Cynipidæ*, where, through the presence of these parts alone, Hartig's assumption of the existence of androgyny will be disproved; 11. *Pteromalini*; 12. *Chelonidæ*; 13. *Evaniadæ*; 14. *Braconidæ*; 15. *Ichneumonidæ*, where the seminal capsule is always very small. In the second type, the receptaculum seminis forms a simple swelling of the vagina, in which can be distinguished neither ductus seminalis, nor a separate capsula seminalis, nor glandula appendicularis: to this belong the *Tenthredinidæ*, of which a considerable number of different genera have been examined. The *Uroceridæ*, *Dryinæ*, and *Codrinæ*, have not yet been examined by the author in relation to the parts in question.

A periodical, "Memoria per servire alla storia naturale di alcuni imenotteri del Cav. Guis. Gené, Prof. di Zool. n. r. u. di Torino, soc. att. d. Soc. Ital. d. Scienz. res. in Modena: Modena, 1842," contains some excellent observations on the habits of individual *Hymenoptera*.

Dispositio Methodica Spec. Scand. ad Fam. Hymenopt. nat. ab A. G. Dahlbom, Lund, 1842, is the precursor of a systematic work, of which at present the first number only has appeared, extending to the Linnæan genus *Sphex*. The families and genera are illustrated on synoptical tables, according to their characteristics, and a view given of the Swedish species.

The reporter has spoken of the Hymenopterous Insects of New Holland (Arch. 1842, i. p. 252), and described a number of species from Van Diemen's Land.

TENTHREDINIDÆ and SIRICES.—Saxesen has published a list of the *Tenthredinidæ* and *Sirices* hitherto found on the Harz (Vier Verzeichnisse als Beiträge zur Kenntniss der Fauna und Flora des Harzes, gedr. f. die Mitglieder des wissensch. Vereins des Harzes, 1842). It is

accompanied by many valuable remarks on their appearance. Leunis has made known a list of the *Tenthredinidæ*, found in Hildesheim and the adjoining Harz (Ent. Zeit. p. 42).

P. Huber* (Mém. d. l. Soc. d. Phys. et d'Hist. Nat. de Genève, ix. pt. 2) has described the natural history of the larva of a *Lyda*, which is found rarely upon hazel bushes, and forms a house for itself by rolling up strips of the leaves. It has not arrived at its change, therefore the species remains undetermined. (This treatise has also been noticed in the Ann. Nat. Hist. xi. p. 241, and Ann. des Sc. Nat. 1843.) Westwood (Ann. Nat. Hist. xi. p. 376) remarks, that this larva may belong to the *Lyda inanita*, of which he has given a short account in his "Introduction" (v. 2, p. 107, f. 71, 11). This determination appears to me still doubtful, as Westwood observed the larva upon roses; and I hold it probable; that a similar habit may be common to the leaf-eating larvæ of several *Lydæ*.

Harris has made some interesting remarks on the natural history of several North American *Tenthredinidæ* and *Sirices*, in the "Ins. of Massachusetts." *Cimbex ulmi*, Peck (male *Americana*, Leach), lives on the common and American elm. A *Lophyrus*, *L. abietis*, Harris, lives on pines. It is very like, or identical, especially the caterpillar, with *L. rufus*, Kl. *Selandria vitis* lives on the vine; the slimy caterpillar of the *S. rosæ*, on the rose; *S. cerasi* (*Tenthr. c.*, Lin., *T. æthiops*, F.) also exists in North America upon fruit trees, especially the pear. *Tremex columba* lives in pear trees, and elms, &c. The larva is attacked by *Pimpla atrata*. *Urocerus albicornis*, F., is found in pine wood; also the new species, *U. nitidus*, different from *U. juvencus*, by its brighter colour and shorter antennæ; and *U. abdominalis*, probably the male of the preceding, in the white pine. There are two new species of *Xiphydria*, *X. albicornis* and *meltipes*; and of *Oryssus*, besides the *O. terminalis*, Newm., and *Sayi*, Westw., there is a third, *O. affinis*, Harris, which possibly may be only the male of the latter.

ICHNEUMONIDÆ.—Drewsen has proved, by observing their pairing, that *Ichneumon culpator*, Schr., is the true female to *I. sputator*, also that *Pimpla flavipes* is the true male to *P. stercorator*, while Gravenhorst has described as such the male of *P. graminellæ* (Kröyer Naturhist. Tidsskr. iv. p. 103). The reporter (Arch. 1842, 1 Bd. p. 255) has described several species from Van Diemen's Land: *Ichneumon peti-*

* By way of appendix, I may mention here another treatise by the same author (ibid.), in which he has given some pretty observations on the *Coccinella globosa*, Ill., but which contains nothing essentially new, as it is already known from other sources, that the species named, as well as some other *Coccinella*, are plant eaters. The generic name of *Subcoccinella* is already the third proposed for the above species, which, contrary to all rule, has been enrolled among *Saponariæ* (S. vor Bericht, p. 258).*

torius, *licitatorius*, *promissorius*, *Cryptus* (*Phygadeuon*) *variegator*, *Ophion fuscicornis*. The first species only has any peculiarity, and as at present several allied species are before me, will give occasion for the formation of a separate genus belonging to New Holland. The rest have altogether a European stamp.

BRACONIDÆ.—Schlödte (Kröyer Naturhist. Tidsskr. iv. p. 315) has remarked, that *Lepton attenuator*, Zetterstedt, Ins. Lappon., is the insect described by him (1837) as *Copisura rimator*. Zetterstedt did not know the female, his description appears to apply at a *Cælinus*. (See my Report for 1838, p. 296.)

Helcon indultor of the reporter is a new species from Van Diemen's Land (Arch. 1842, i. p. 258).

EVANIDÆ.—Spinola (Rev. Zool. p. 188) has described three new species of *Evania*: *facialis* from Mexico, *chilensis* from Chili, *crassicornis* from Columbia.

The reporter has described a new species of *Megalura*: *rufipes*, from Van Diemen's Land (Arch. 1842, i. p. 258).

CYNIPIDÆ.—Hartig (Germ. Zeitschr. iv. p. 395) has published his farther investigations into the natural history of the *Cynips*. Although he withdraws his former assertions (see the preceding annual report) concerning the internal structure of the male *Cynips*, still he draws attention to this family in a physiological respect, by showing that the males of some species are unknown; such are, especially, *Cynips divisa* and *C. quercus-folii*,* which he obtained in great numbers, partly from galls and partly caught in the open air; he also remarks, that in the breeding of *Cynips* from galls, the absence of the male cannot be accidental; that moreover, whole genera (e. g. *Cynips* with twenty-eight species) are without males, while in the rest (e. g. *Aulax* and *Synergus*) both sexes of all the species are found; and thinks, that from the comparison of the internal structure of the one, and both-sexed *Cynipidæ*, something more certain will be discovered. Siebold is at present busy with these investigations, so that we may shortly expect a solution from that quarter; however, it appears to me, that he should not neglect these so called *Inquilini*. Hartig has certainly expressed, in his first treatise (Germ. Zeitschr. ii. p. 178), that they not only live parasitically in and on strange galls, but also on their proper inhabitants; he has not however added, that this is nothing more than conjecture. The constant presence of two forms of *Cynips*, in all galls, is striking, and might easily lead to the supposition, first made by Ratzeburg (Mediz. Zool. pt. ii. t. 21), that a compound sexual relation here occurs, as is also the case in other orders

* The author mentions, that Professor Ratzeburg had told him, that he was in possession of a male of this species. Upon farther examination, the Professor has informed me, that he is now convinced of the contrary.

of insects. We know, for example, that *Papilio Memnon* has three different forms of the female, in colour and form of the wings. And if Hartig separates the *Inquilini*, as genera, from the producers of the galls, the like has happened with the two forms of the female of *Dytiscus*. The most important fact against such an assumption, seems to be his statement, that different kinds of *Cynips* have the same *Inquilini*. I mention the above only, that the observer may bear in mind facts which will probably open another point of view to him. In my opinion, there can be no question concerning a relation in their breeding, as both forms appear together in the same galls, and therefore they spring from contemporary broods.

Hartig, at the same time, makes an addition to the species, enriching *Cynips* with fourteen, *Andricus* with one, *Teras* with one, *Aulax* with two, *Synergus* with six, *Cothonaspis* with three, *Figites* with one, *Psilogaster* with two new species. Two genera are also characterized: *Synophrus*, nearly allied to *Diastraphus*, but distinguished by the great length of the first abdominal segment, which covers the rest both on the upper and under side: *S. politus*, collected by Kollar from the gall of *Quercus cerria*. *Xyalaspis*, a form of *Figites*, with a pedicelled abdomen, doubtless agreeing with *Callaspidia*, Dalhb. (v. inf.): *X. laevigatus* and *rugosus*, both from Styria.* The generic name, *Scytodes*, already used elsewhere, the author has changed for *Amblynotus*.

Dalhbom has published a little work, which, as the title shows, is a monograph of the two genera named, "Onychia och Callaspidia tvenne för Scandinaviens Fauna nya Insekt-Släkten, hörande till Galläple-Stecklarnes naturliga grupp, Monografisk bearbetning 2 Planch. och. 2 Synopt. Tabell., Lund 1842." *Onychia*, Haliday, contains three species: *O. bicolor* (*Figit. bic.* Fonscol.); *O. ediogaster* (*Evan. ediog.*, Ross., *Cyn. ediog.*, Panz.); and *O. aculeata* (*Fig. acul.*, Brebiss.)—*Callaspidia*, Dalhbom (with which the more recently recorded genus *Xyalaspis*, Hartig, agrees, vid. sup.), is related to *Figites*, as *Anacharis*, Dalm., is to *Cynips*—it has, namely, a long pediculated abdomen, and contains two species: *C. De Fonscolombei*, Dalhb. (*Figites notata*, Fonsc.); and *C. Westwoodi*, Dalhb., a new species discovered by the author in Gottland. The three tables appended give a list of the *Cynipidæ*, natives of Scandinavia, the distinctions of which are partly illustrated by plates.

Harris (Ins. of Massachus. p. 395–400) has made some observations on the North American *Cynipidæ*. They are mostly found on oaks, the largest are on the leaves of the red oak, and belong to the *Cynips confluentus*, (!) Harr. From *Cynips oneratus*, Harr., originate galls on the small branches of the white oak, which resemble Sodom apples. *Cynips nubilipennis* raises galls on oak leaves of the size and colour of currants. *Cynips seminator*, Harr., one of the smallest species, lays its eggs round the small branches of the white oak, and the individual

larvæ rest in seed-like cells, surrounded by one common gall. Upon roses are found *Cynips bicolor*, in single galls, about the size of peas; *C. dichrocerus*, in woody galls on the stem; *C. semipiccus*, in warted woody galls on the root.

CHALCIDIDÆ.—Walker has continued his description of the *Chalcididæ* collected by Darwin (Ann. Nat. Hist. x. p. 113). From Valparaiso there are one *Torymus*, two *Callimone*, one *Asaphes*, one *Lamprotatus*, one *Lyrcus*—a new genus, the characters of which are not given—one *Pteromalus*, two *Entedon*, one *Eulophus*, two *Tetrastichus*—a genus formed by Haliday from the *Cirrospilus lycidas*. From Valdivia (p. 271) are one *Pachylarthrus*, one *Dicyclus*, three *Lamprotatus*, one *Pteromalus*, one *Closterocerus*, one *Platygaster*, one *Inostemma*, one *Romilius*; this last genus is new, but here also the characters are omitted. The same author (Entomologist, p. 334) has continued his descriptions of new *Chalcididæ*: *Isosoma egesta*, *Selinnus diorea*, *Pteromalus Bryce*, *Pt. felginas*, and *Entedon daurises*, are from Geneva; *Smiera lamyrus*, from Mexico; *Sm. pylas*, of unknown locality; *Sm. dares*, *Chalcis orseis*, *Hookeria hydara*, from Brazil. *Selinnus* is a new genus, seemingly allied to *Eurytoma*.

CHRYSIDIDÆ.—Guérin (Rev Zool. p. 144) has described twenty species of this family: *Stilbum viride*, from Madagascar; *Stilbum 6-dentatum*, from Senegal and Algiers (the latter is not a *Stilbum*, but *Chrys. nobilis*, Kl., *Pyria stilboides*, Spinola); *Chrysis (Pyria) Mouattii*, *Gheudii*, and *bispilota*, from Madagascar; *orientalis*, from Sumatra; also a curious *Chrysis*, with a six-toothed point to its abdomen, *Chr. insularis*, from Cuba; *Chr. syriaca*, with a four-toothed point, from Syria; *episcopalis*, from Chili; *Miegii* and *Grælsii (Chr. analis, Spin.)*, from Barcelona; *igniventer*, from Algiers (probably *Chr. scutellaris*, F., supposing the blue margin of the end of the abdomen to be overlooked); *Mionii*, from Senegal; *Chr. truncata*, from North America (*Pyria tridens*, Enc.); *brasiliensis*, from Brazil; *Polinieri*, from Senegal; *Chr. bella*, from Madagascar, with a toothless point to the abdomen; a new sub-genus, *Pleurocera*, formed from a Chilean species: *Pl. viridis*, only differs from *Chrysis* in the antennæ being dilated in the middle externally, and the point of the abdomen slightly four-toothed; lastly, *Hedychrum viride*, from Constantina.

CRABRONIDÆ.—Gené (l. c. p. 29) has published his remarks on the *Stigmus ater*; as this small insect is abundant in Italy, he supposes it to be very useful, from destroying the *Aphidæ*.

SPHEGIDÆ.—Dalhöm (Disp. Meth. p. 2) has formed a peculiar genus, *Psemmophila*, from those species of *Amnophila* which have a one-jointed peduncle to the abdomen. Among the *Pompilidæ* he has characterized (ibid. p. 3) a new genus, *Isonotus*, which includes the *P. sanguinolentus*, F., and which principally differs from *Pompilus* by the

differently formed claws. At a later period (Entom. Zeit. p. 214) he convinced himself, that in *Pompilus* the claws present great varieties, so that *Isonotus* is distinguished from *Pompilus*, preferably, by the head being closely attached to the collar, and the proportionably large clypeus. The name has been already applied by Perty to a genus of beetles.

Westwood (Proc. Ent. Soc. Lond. p. 53) has given an account of an undescribed New Holland *Pompilus* (*audax*, Westw.), the pupæ of which were found at Port Lincoln; each pupa was in a cell; several of these cells were attached together, and seemed formed of a succession of short transverse layers; it appeared evident, that these nests had not been enclosed in a burrow, but were external, the materials having been brought from a distance. In one of the cells the remains of a very large spider, which had evidently served as the food of the enclosed larva, were found.

BEMBECIDÆ.—The reporter has described a new species, *Bembex furcata*, from Van Diemen's Land (Arch. 1842, i. p. 266).

SAPHYGITÆ.—Gené has made known some important discoveries in the habits of the *Polochrum repandum*. He found small black barrels in the nests of *Xylocopa violacea*, which Spinola asserted to belong to them, out of which he had reared the *Pol. repandum*. Prof. Zendrini has made similar experiments at Pavia, so that it appears from this, that *Polochrum repandum* lives as a parasite in the nest of *Xylocopa violacea* (l. c. p. 25).

THYNNIDÆ.—Guérin (Mag. de Zool. ins. pl. 99–105) has subjected to revision the genera of *Thynnidæ*, characterized by him in Duperrey's work, adding some new ones, and illustrating them all by figures. These investigations still leave much to be desired, and even yet, scarcely one of the genera is sufficiently characterized to be recognised.

As a comprehensive monograph is expected from Mr. Shuckard, it does not appear to me proper to go deeper into details, than to name the newly characterized genera and species: *Rhagigaster hæmorrhoidalis*, a new species from Swan River; *Agriomyia marginilabris*, *affinis*, *Westwoodii*, *abdominalis*, new New Holland species; for the last two, with longer antennæ and long fringes at the posterior margin of the head, the author proposes a generic name, *Tachynomyia*; *Thynnus Shuckardii*, *flavilabris*, new New Holland species; *Catocheilus*, a newly characterized genus, closely allied to *Agriomyia*, but the labrum is quite concealed under the projecting clypeus, and the last joint of the maxillary-palpi rudimentary; *C. Klugii*, from Swan River, is a new species, of which both sexes are described; *Thynnoides nigripes*, a new species from Swan River. *Lophocheilus*, differing from *Thynnoides* by the labrum being hairy at the margin and truncated, short maxillæ, only slightly hairy at the outer margin, and especially by the lip, to which the tongue appendage is drawn in, and always provided with a long tuft

of hair: *L. villosus*, *L. distinctus*, and *L. (?) collaris*, new New Holland species.

The reporter (Arch. 1842, i. p. 262) has described several new species from Van Diemen's Land: *Thynnus Olivieri*, of which *Myzine aptera*, Ol., is the female; *Th. senilis* and *fervidus*, the former belonging to the first, the latter to the third of Klug's sub-divisions, and *Th. humilis*, a female; lastly, a new genus, *Ariphron*, has been characterized (tab. 5, f. 8) from an individual female, which varies from that of *Thynnus* by having simple claws, and the abdomen not being swollen, &c. The species is called *A. bicolor*.

MUTILLARIÆ.—The reporter (l. c. p. 261, 262) has described two new species from Van Diemen's Land, *Mutilla soluta* and *blanda*.

DORYLIDÆ.—Westwood has given an excellent view of this group (Arcana Ent. i. p. 73, pl. 20), for which the labours of Shuckard have laid the foundation. *Labidus* is enriched with several new species, viz., the division with a triangular pedicel to the abdomen, with *L. Burchelli* from Brazil, which, however, may be identical with *L. Fargeavii*, Shuck. (*Latreillei*, Lepell.), supposing that an error has occurred in the account of the size (14'''). Our specimens of this insect have a dilatation on the mandibles internally below the point, which the author's figure does not show. Also with *L. Servillei* from Pará. The division, with a transverse quadrangular pedicel, has been increased with one small sub-division, viz.,—such as have moderately long legs; in this are two Brazilian species, *L. Hartigii* and *Esenbeckii*, both distinguished by long tufts of hair on the sides of the abdomen; the other species of this division have remarkably short legs. To those described by Shuckard, are added *L. Fonscolombii*, *Gravenhorstii*, *Spinola*, *Walkerii*, *Erichsonii*, all from Brazil. The genus *Ænictus* has been enriched with a second species, *Æ. certus*, whose native country is unknown; *Dorylus* and *Rhognus* contain only the species described by Shuckard. On the plates, several of the new species, and the parts of the mouth of *Labidus*, are figured. Westwood thinks, that the *Dorylidæ* approach the ants by the separated first ring of the abdomen, and he considers them as belonging to the same group; at all events, they stand nearer these than any other family.

FORMICARIÆ.—Robert has laid some observations on the habits of the ants before the Parisian Academy (Ann. d. Sc. Nat. xviii. p. 151, and Froriep, N. Notiz. xxiv. p. 113). One of them concerns the roads which *F. rufa* makes outside the nest. When the swarm is old and strong, ten roads run pretty regularly from the nest in the form of rays, as far as the surrounding country permits, at regular distances, and only in very extreme cases deviating from the straight direction. The author could follow these roads for 47 metres; nay once, where, from the nature of the ground, only five were formed, for 77 metres. He explains

the presence of many other insects in ants' nests, particularly the larva of *Cetonia*, by their feeding upon the rotten wood collected in the nest; but doubts whether they are acceptable to the inhabitants.

The high temperature, which is found in the interior of the ants' nests, does not arise from the mass of insects themselves, but from the decomposition of animal and vegetable remains there gathered together, for a like temperature is found in deserted nests. This last remark appears to me very important in gaining a correct view of the accumulations of the ant, and their connection with so many fellow inhabitants. The ants prepare for themselves a sort of boggy bed under their nest, and favour the presence of other insects in it, which, as they feed upon the boggy mass, further its decomposition, and by this means the development of heat.

Fred. Smith (Transact. Ent. Soc. London, iii. p. 151) has made some observations on several British Ants, principally with regard to the appearance of the different states. His account is deserving of notice. He states, that the ants seize upon and carry into their nest, the *Aleocharæ* found there (*Myrmedonia*, *Lomechusa*, *Atemeles*, *Pella*), and if they attempt to fly away, they are taken again and brought back.

Gené has given an excellent description of the natural history of the *Myrmica rediana*, of which, although distributed over all Italy, and living in chinks of walls and cracks in the bark of old trees, the sexes are not yet satisfactorily determined (l. c. p. 3).

The reporter (Arch. 1842, l. p. 256) has described four new species of *Formica*, and characterized a new genus, *Ambypoone*, which, belonging to the group *Poneræ*, has the form of mandibles common to *Myrmecia*, F., and is distinguished by its very small eyes. The workers alone, of the single species, *A. australis*, were at that time known; the female has now been procured.

VESPARÆ.—Gené has made an observation on the presence of *Filaria* in the Hornet, *Vespa crabro* (l. c. p. 20). He placed the worms which came from the body of the insect in water, where they lived for a long while, as if in their natural element.

APIARÆ.—Thwaites (Proceed. Ent. Soc. p. 57) believes, that the *Prosopis* (*Hylæus*) is not parasitical. He has reared two specimens from the stalks of brambles, the burrows in which exactly agreed in width with the thickness of the insect, and there were no other bees small enough to have made them, and likely to be found in that situation, except *Heriodes*, which do not occur in that neighbourhood (Bristol). The cells lie in a row close behind each other, the males foremost, so that they must first creep out. It is very desirable, that we should find out upon what the larva feeds, as the bee possesses no external contrivance for carrying in pollen. Five species of the same genus have been characterized as new by F. Smith (ibid. p. 58); but with a diagnosis

which is not now sufficient in a genus, so rich in species distinguished from each other with difficulty.

The reporter (Arch. 1842, i. p. 267) has described several new species of the group *Andrenidæ*, from Van Diemen's Land: *Prosopis alyconæa*, *Hylæus familiaris*, *Andrena chalybeata*, *infima*.

Gené (l. c. p. 21) relates, that *Osmia ferruginea*, Latr., which in the beginning of spring appears very plentifully on the sea-coast of Sardinia, forms its nest in the shells of land snails, particularly *Helix vermiculata* and *rhodostoma (pisana)*.

Eried. Koch, of Stuttgart, spoke at the meeting of Natural Historians at Mainz, on the sexual relations of bees, in which a new view was given of the proceedings of the male, viz.,—that they do not unite with the queen, but deposit the seminal fluid in the cells. Müller of Odenbach, however, has disproved completely this ungrounded and indistinct assertion (Amtl. Bericht über d. 20 Versamml. d. deutsch. Naturf. u. Ärzte zu Mainz in Septr. 1842, p. 198).

Spinola (Rev. Zool. p. 216) has reverted to the sexual relations of the *Melipones*, as he doubted my account of the fruitful female (Report for 1840, p. 219). My expression, they were (vielmal) "many times" larger than the workers, had been translated to him "souvent" (often). Afterwards. (ibid. p. 267) he has asserted, that he received a female of *M. fulvipes*, which was smaller than the workers, and many were found in one nest. The opinion, however, that these individuals were actually females, is not well founded. The idea newly entertained, that the individuals of the *Trigona angustula* usually seen are females, I must again combat, for this is exactly one of those species of which the Berlin collection possesses a male, queen, and worker, taken from their nest (Vide Report for 1840, p. 209).

STREPSIPTERA.

SIEBOLD has cleared up the natural history of these insects by very interesting and extensive observations, of which he gave a brief report at the meeting of Natural Historians at Mainz (1842), (Amt. Bericht, &c. p. 211). The most important point is, that the winged individuals hitherto known are only males; that the females live, like larvæ, in their victim; and that the six-legged insects, formerly called parasites, are the young larvæ, which, after they have sought out a new animal to dwell in, and have penetrated the posterior part of its body, lose their feet when they next cast the skin, and become larvæ provided with a mouth, but no anal opening.

As the masterly work of the author is copiously quoted in these Archives (1843, i. p. 137, t. 7), I may refer to it.

LEPIDOPTERA.

LEFEBVRE (Ann. de la Soc. Ent. de Fr. xi. p. 5) has anew drawn attention to the importance of exact observation of the nervures in the wings of Butterflies, and given many hints how their varieties are to be used in systematic division. He has considerably advanced our knowledge of this portion of their structure, as he has found out a sheath between the anterior and posterior nervures, viz.,—a fold which stretches inwards from the outer margin to the middle cell. The treatise has also been abridged in the Rev. Zool. p. 52: there are figures which illustrate it.

Fischer Edl. von Rösslerstamm's excellent work, "Abbildungen zur Berichtigung-und Ergänzung der Schmetterlingskunde, besonders der Microlepidopterologie," has, unfortunately, concluded with the twentieth number. On the other hand, Freyer's "Neue Beiträge zur Schmetterlingskunde mit Abbildungen nach der Natur," is happily progressing undisturbed. (The 58-68th numbers are before me for this report.)

Hering continues his many valuable and copious contributions to the *Lepidoptera* of Pomerania (Ent. Zeit. p. 5).

Many observations of different collectors, on the Butterflies of England, are to be found in the Entomologist, p. 258, 260, 277, 283, 356, 357, 358, 389, 393, 394, 396, 408; also Ann. Nat. Hist. x. p. 365.

Rambur has begun his labours on the *Lepidoptera*, for his Fauna of Andalusia. I have not yet, however, received the number, and its appearance is only known to me by the judgment pronounced upon it in Lefebvre's treatise mentioned above.

New *Lepidoptera* of West Russian Asia have been described by Eversmann (Bull. Mosc. p. 543).

Harris has given an excellent view of the natural history of the most important *Lepidoptera* of North America (Ins. of Massachus.), including much that is new; but which I hesitate to extract. It would be well if one of our entomological periodicals would give a comprehensive abridgement of the work.

The Butterflies of Merian have been systematically arranged and illustrated by Freyer; and are accompanied with remarks (Isis, p. 18, 327).

PAPILIONIDÆ.—Westwood has given a critical view of the African species of *Papilio* (Arcana Ent. i. p. 145, t. 37-40). There are figured: *P. Thersander*, F. (t. 38, f. 1, 2); *Lalandei*, God. (t. 37, f. 1, 2); *cynorta*, F. = *Zerynthius*, Boisd. (t. 40, f. 3, 4); *Boisduvallianus*, Westw., new species from Guinea (t. 40, f. 1, 2); *trophonius*, Westw. (t. 39, f. 1, 2); *adamastor*, Boisd. (t. 38, f. 3); *agamedes*, Westw. (t. 39, f. 3, t. 37, f. 3). This last is only a variety of *adamastor*, with which it is united by many intermediate forms. The author joins *P. cenea*, Stoll. (not Linn.) to the *P. trophonius*; but at present I do not agree

with him, as they are strikingly different in colour, and I cannot assume for them a difference of sex, as the specimens in the Berlin collection are both of the same sex. It is to be remarked, according to Westwood, that *P. antenor*, Dr., an African insect, as well as *Agapenor*, F. (not Boisd.) is *policenes*, Cr., and *polyxenes*, Enc.; also, that *antheus*, F., is *antharis*, Enc., and *agapenor*, Boisd.; that *messalina*, Stoll., is *cynorta*, Boisd. (not Fab.); that *hippocoon*, F., is *Westermanni*, Boisd.; finally, that *P. orestes*, F., is probably an East Indian *Eques*, allied to the *Nomius*, Esp., perhaps with a mutilated tail.

Westwood adds (ibid. p. 189) two new species from the Gold Coast: *P. charopus*, allied to *P. nireus*, and *P. hesperus*.

Many species of *Papilio* have been described and figured. Westwood (Ann. Nat. Hist. ix. p. 36) has given the diagnosis of a series of new species from Sylhet: *P. bootes*, *astorion*, *chara*, *castor*, *pollux*, *arcturus*. The last, which is widely distributed in the Himalaya, and the first, are also figured (Arcan. Ent. t. 27 and 31). Doubleday has also described (Gray, Zool. Misc. ii. 73), as from Sylhet: *P. ganesa*, *P. polyeuctes*, and *xenocles*, from Nepal and Assam, of which the first agrees with the *P. arcturus*, the second with *bootes*, Westw.; the third must be the same with *pollux*, W.

Adam White has made known two new species from the island of Penang: *P. varuna* and *iswara* (Entomol. p. 280).

From the same place, and from the coast of Malacca, Guérin (Deless. Souv. ii. 68-71, t. 17-19) has figured some species previously characterized in the Rev. Zool.: *P. Delessertii* (perhaps *melanides*, De Haan), *P. neptunias*, *P. saturnus* (= *nephelus*, De Haan), *P. brama*, Guér. (ibid. p. 71) = *Pulinurus*, De Haan. *P. canopus*, Westw. (Ann. Nat. Hist. ix. p. 37), from Melville Island, is a species allied to the *P. pammon*.

Westwood has figured a new species from Mexico (Arc. Ent. i. p. 67, t. 18), *P. montezuma*; and has given upon the same plate a figure of *P. pelaus*, F., an American species whose locality is not exactly known.

Klopsch (Arbeit. der Schles. Ges. f. vaterl. Kult.) has given some observations on the caterpillar of the *P. podalirius*.

Pierides.—A new species of *Anthocharis* has been discovered by Captain Charlton at Emsilah in Barbary, and has been made known by Donzel under the name of *A. charlonia* (Ann. d. l. Soc. Ent. d. Fr. xi. p. 197, t. 8, f. 1). It is a male, allied to the *Belia* and *Belemia*, but with a sulphur-yellow ground colour.

Various new species have been described by Doubleday (Gray, Zool. Miscell. ii. p. 75): *Leptalis atthis*, from Mexico; *L. cydno*, of unknown locality; *Pieris thestylis*, from Sylhet; *P. lalage*, ibid., distinguished by its sickle-shaped anterior wings; *P. janthe*, from Sierra Leone, near to *P. hedyle*, Cr., and probably only a variety of it; *P. anactorie*, from

South Africa, appears to be female of *Cherine*, Boisd.; *Rhodocera lycorias*, with a different shape of wing from *Sylhet*.

Danaides.—*Danaïs chloe*, Guérin (Deless. Souv. ii. p. 71) is a new species from the island of Penang.

Nymphalides.—*Godartia* is a new genus, characterized by Lucas (Ann. d. l. Soc. Ent. d. Fr. xi. p. 295, f. 12, 11). He notices, amongst its characters, the rounded section of all the wings: *G. madagasca-riensis* is from Madagascar.

Freyer (Beitr. 60 Hft. t. 355, p. 117) has separated a Norwegian Butterfly as *Argynnis ossianus*, from *A. aphirape*; but it appears to me to be a bright coloured variety of *aphirape* rather than the *ossianus*, Hübn. The same author (ibid. t. 343, 385) has figured beautiful varieties of *Limenitis populi* and *Apatura iris*, as well as the earlier states of these insects.

Guérin (Deless. Souv. 11, p. 72) has described *Argynnis emalia* as a new species from the coast of Malacca, and given a plate and exact description of his *Vanessa eudoxia*, from the same place.

Satyrides.—Freyer (Beitr.) has represented the earlier states of *Hipp. phædra* (t. 373), *gataltea* (t. 379), *dejanira* (t. 391), and *ægeria* (t. 403). He has also given a plate of *H. aristæus*, Bon., male (t. 397), from Sardinia; of *Iphis*, a variety from the anterior range of the Caucasus (t. 367); and distinguished as a species *H. satyrion* from *H. philea*, Hübn. (*satyrion*, O.) It is only a slight variety (with a broader and whiter band on the under side of the posterior wings, and smaller ocelli on them), to which there are sufficient transitions.

Several new species from the Nilgherries have been described by Guérin (Del. Souv. ii. p. 74, t. 24): *Satyrus (Cyllo) neelgheriensis*, very like the *Sat. europa*, and probably only a local variety; *S. Adolphei* and *S. chenu*.

Lycenides.—Freyer (Beitr.) has figured the following (partly new) species: *Lycæna rhymnus*, Fr., *damone*, Ev., *anteros*, Boisd., from Russia (t. 386), and *L. bellis*, Fr., from Turkey (t. 398). Guérin (Deless. Souv. ii. p. 78, t. 22, fig. 1) has figured a new species, *Polyommatus nyseus*, from Pondicherry.

The history of the metamorphosis of the *Thecla isocrates*, has been described in the Transact. Ent. Soc. of Lond. (ii. p. 1), in which it is asserted, that the caterpillars, which live in pomegranates, bore their way out of the fruit, and spin a web round the stalk, that the fruit may not fall off; then creep in again and become pupæ. Downes has observed the same caterpillars (Calcutta Journ. of Nat. Hist. ii. p. 408), and cannot confirm either the spinning round of the stalk, nor the becoming pupæ in the fruit; but only found, that the caterpillar came out of the pomegranate in which it lived, and was changed into a pupa on the outside of it. He found no pupa within a pomegranate.

Hesperidæ.—Freyer (Beitr.) has figured a series of species belonging to the genus *Syrichthus*, Boisd., but some of them I think are doubtful: *H. cribellum*, Ev. (t. 349, f. 1), is not different from *H. tessellum*, O.; *H. cynaræ*, Boisd. (ibid. f. 2), is certainly only a variety of *H. carthami*, with which it is united through imperceptible transitions; also *H. Marubii*, Ramb., from Andalusia, can be hardly any thing else than a local variety of *H. altheæ*.

Hesp. Benjaminii, Guérin (Deless. Souv. ii. p. 79, t. 22, f. 2), is a splendid new species from the Nilgherries.

SPHINGIDÆ.—H. Doubleday (Entomol. p. 357) has related, that he found in his breeding cage *Smerinthus ocellatus*, male, and *Sphinx ligustri*, female, in copula, whilst several individuals of both sexes, and both species, were found at the same time in the same cage.

Guérin (Deless. Souv. ii. p. 80, t. 23, f. 1) has described *Deilephila vigil*, a new sphinx of Pondicherry, allied to the *Sph. velox*, F., and (p. 80) a variety of the *Macroglossa hylas*, from the Nilgherries.

SESIARIÆ.—Nickerl (Ent. Zeit. p. 68) has published his observations in correction of Ochsenheimer's account, that the caterpillar of the *Sesia culiciformis* lives under the bark of birch trees, and never penetrates into the interior of the stem, whilst that of the *S. mutilliformis* lives in plum, apricot, and apple trees, and certainly never is found in the interior of the stem. Freyer has also given a figure of the former (Beitr. 61. Hft. t. 362, f. 2). The same author (ibid. f. 3, p. 132) has characterized a new species, *S. serratiformis*, from Hanover, which seems to me to be identical, according to the incomplete figure, with *S. rhingiaformis*, O.; also two new species, *S. triannuliformis* (!) and *minianiformis* (!!), from Turkey (t. 404); and lastly, *Chimæra orbonata*, Fr. (t. 351), from the Steppes at Sarepta.

CHELONIDÆ.—Freyer (Beitr.) has figured *Euprepria simplonia*, Boisd. Ind. (t. 392), but with the well-grounded remark (5 Bd. p. 16), that it may be only a variety of the *E. maculosa*; similarly, in the Berlin collection, *E. honesta*, Fr. (t. 344), from Southern Russia, is arranged as a variety of *E. maculosa*; *E. matronalis*, Fr., is also only a remarkable variety of *E. plantaginis*. On the other hand, *E. intercisa*, Fr., is a very marked species (already noticed by Pallas), (t. 356, with the caterpillar), from the Salt Steppes of Southern Russia.

Costa (Ann. d. l. Soc. Ent. d. Fr. xi. p. 239, t. 9, f. 7, 8) has shown, that *Callimorpha donna* is only a local variety of *C. dominula*: it is found in Calabria; another is found in the Abruzzi, which agrees with *dominula* in the markings on the wings, and the abdomen has the colour of *donna*.

Guérin (Deless. Souv. ii. p. 83) has enriched the genus *Gynautocera* with five new species: *G. marginata*, from the island of Penang (also native to Java); *macularia*, from Malacca; *phalenaria*, from Java

(perhaps a variety of *Sph. pectinicornis*, L., *tiberina*, Cr.); *distincta*, from Malacca; *affinis*, ibid., and Pondicherry; also *Hazis malayanus*, from Malacca; *Euchelia gratioa*, *Callimorpha? Marchalii*, *Arctia montana*, and *indica*, from the Nilgherries.

Bombyces.—Joly (Rev. Zool. p. 115) has given a notice of a plague of caterpillars of the *Liparis dispar*, in the oak woods in the neighbourhood of Toulouse, in the years 1837, 38, 39.

Freyer (Beitr.) has given figures of the earlier states of *Harpyia bicuspis* (t. 363), and *Notodonta querna* (t. 387). He has (ibid. t. 380) pointed out the difference between *Lithosia complana*, *griseola*, *aureola*, *luteola*, *helveola*, and *depressa*.

A new North African species, *Bomb. philopalus*, from Constantine, has been described and figured by Donzel (Ann. d. l. Soc. Ent. d. Fr. xi. p. 198, t. 8, f. 2).

Guérin (Deless. Souv. ii. p. 94, t. 27) has described three new species from the Nilgherries, which are nearly allied to each other: *Bomb. flavicollis*, *collaris*, and *Adolphei*.

Noctuidæ.—Doubleday has given a list of the *Noctuidæ*, natives of England, according to Guénée's division (Entomologist, p. 297).

European *Noctuidæ*, some newly characterized, and others previously not figured, have been figured by Freyer (Beitr.) and Germar (Faun. Ins. Europ.): *Cymatophora lineata*, Fr. (t. 370), from Turkey; *Agrotis velum*, Kuhlw. (Germ. t. 13), *erupta*, Kuhlw. (Germ. t. 15), *murina*, Fr. (t. 364), are German species; *A. fusca*, Boisd. (Fr. t. 393), and *cataleuca*, Boisd. (Fr. t. 399), from the mountains of the south of Europe; *A. Heydenreichii* (Germ. t. 14), from Dalmatia, figured by Fr. (t. 393) as *Hadena fatidica*, Hübn. *Hadena amentata*, Germ. (t. 16), from Sicily; *Onspurgeri* (*dentina*, var.), Boisd. (Fr. t. 394), from Switzerland; *arctica*, Boisd. (Fr. t. 394), from Lapland; *Miselia nesus*, Germ. (t. 18), from Sicily; *Mamestra cervina*, G. (t. 19), from Iceland; *Mythimna alliacea*, G. (t. 20), and *Gortyna xanthenes*, G. (t. 22), from Sicily; *Leucania flava* (Fr. 370), *L. montium*, Boisd. (Fr. t. 395), *L. Andereggii*, Fr. (t. 395), *L. zeæ*, Boisd. (Fr. t. 406), *L. caricis*, Fr. (t. 401), and *Xylina nux*, Fr. (t. 370), from Hungary; *Cleophana Laudeti*, Fr. (t. 395), from Switzerland; *Anthophila cretula*, Fr. (t. 360), from Ragusa; *A. signalis*, Fr. (t. 360), from Hungary (Ofen).

Bentley (Entomologist, p. 254, 317) has given some critical remarks on different species of *Agrotis* and *Caradrina*.

Freyer (Beitr.) has figured the following *Noctuidæ*, with their caterpillars:—*N. solaris* (t. 345); *luctuosa* (t. 346), of which the caterpillar, having sixteen feet, differs widely from that of the former with only twelve feet, and agrees generally with that of the following, *N. leucomelas* (t. 347), so that the *luctuosa* must be removed from the genus *Acontia* to *Catephia*; all the three are found upon the *Convolvuli*. *Ocullia*

Santonici, Hü. (t. 357); *N. unanimitis*, which Freyer, judging from the caterpillar, would remove from *Apamea* to *Hadena*, whilst Boisduval places it in his genus *Luperina* (t. 371); *Cymatophora flavicornis* (t. 375), *Xanthia citrigo* (376), *Triphæna fimbria* (t. 381), *Hadena leucophaea* (t. 382), *Heliothis incarnata* (t. 383), *Catocala electa* (t. 407).

Bryand (Ann. Soc. Ent. d. Fr. xi. p. 37, t. 4, f. 1) has given a description and figure of the caterpillar of *Eriopus pteridis*, which is very rare in France. Both the sexes of *Stilbia stagnicola* have been described by Graslin (ibid. p. 303, t. 13, f. 1-7), with the complete history of its metamorphosis. It is remarkable for the weak form of the fly, and robust caterpillar, corresponding entirely with those of *Hadena* or *Orthosia*. It lives exclusively on *Gramineæ*. He has also described the habits and caterpillar of *Dianthoscia luteago* (ibid. 313, t. 13, f. 8-10); it feeds on *Silene inflata*, the egg is laid on the outside of the plant in the beginning of June, the larva penetrates the nearest knots of the stalk, and descends gradually through the stalk to the root; it is at its full growth in August, and becomes a pupa in the ground.

Some remarks have been made on *Diphthera ludifica* in the "Entom. Zeit.," by Rosenhauer (p. 35) and Richter (p. 165).

Many new species of the *Noctuidæ* of Southern Russia (or rather West Russian Asia) have been made known by Eversmann (Bull. Mosc. 1842, p. 543-555), and Freyer (Beitr.): *Agrotis valesiaca*, Boisd. (Fr. t. 351), *adumbrata*, Ev. (p. 543), *immunda*, Ev. (t. 5, f. 3), *deserticola*, Ev. (t. 5, f. 4), *rustica*, Ev.; *Hadena leucodon*, Ev. (Fr. t. 359), *ochrostigma*, Ev.; *Mamestra cervina*, Ev. (p. 546), *infernalis*, Ev.; *Miselia nummosa*, Fr. (t. 351); *Leucania alopecura*, Boisd. (Fr. t. 359), *maculata*, Ev. (t. 5, f. 4), *lineata*, Ev.; *Caradrina squalida*, Ev., *exilis*, Ev.; *Orthosia cavernosa*, Ev. (t. 5, f. 3); *Cosmia imbuta*, Boisd. (Fr. t. 359); *Gortyna morio*, Ev. (*Apamea morio*, Fr. t. 388); *Xanthia ferrago*, Ev. (Fr. t. 364); *Cucullia rimula*, *cineracea*, *mixta*, *biornata* (Fisch.), Fr. (t. 352); *Balsamita*, Boisd. (Fr. t. 358, with the caterpillar); *incana*, Ev., Fr. (t. 388); *fraudatrix*, Ev. Fr. (t. 388), *fuchsiana*, Ev. (t. 5, f. 6, *C. Fuchsii*, Fr. t. 388), *pustulata*, Ev. (t. 5, f. 5), *propinqua*, Ev. (t. 5, f. 7); *Plusia uraliensis*, Fr. (t. 389, *Pl. illustris* var. *uralensis*, Ev. p. 554), *macrogamma*, Ev.; *Anarta cora*, Fr. (t. 389); *Heliothis pulchra*, Ev. (t. 5, f. 8); *Anthophila concinnula*, Boisd. (Fr. t. 360), *parallela*, Fr. (ibid.), *amasina*, Ev.

Germar (Faun. Ins. Europ.) has also figured some West Siberian *Noctuidæ*: *Hadena cancellata*, *Caradrina chaldaica*, *Cucullia argyrea*, *magnifica*, and *flammifera*; of these, however, the first four have been already figured by Freyer, the third even earlier, by Esper, under the same name; the last is the same with *Cuc. biornata*, Fisch., Bull. Mosc. 1839.

Ionthe, a remarkable new genus of *Noctuidæ*, has been characterized by E. Doubleday (Entomol. p. 297); the anterior wings are narrow, the

posterior strongly produced at the anal angle, the abdomen very long, with a thick pencil of hairs at the end; the fly has very much the appearance of the *Pyralidæ*, but the author finds a nearer alliance to the genera *Ophiusa* and *Ophideres*; the species *I. umbrina*, is a new discovery from Sylhet.

GEOMETRIDÆ.—Freyer (Beitr.) has made known several new German species: *Gnophos falconaria*, Fr. (t. 377), from the Alps; *Larentia lariciata*, with its caterpillar, which is found on larch trees (t. 366); and *L. arceuthata*, with its caterpillar, on the juniper (t. 372).

Numeria agaritharia, Dardoin, is a new French species, the caterpillar of which is found on the *Ulex* (Ann. d. l. Soc. Ent. d. Fr. xi. p. 201, t. 8, f. 3, 4).

Guénéé (ibid. p. 243) has observed, that in the summer-brood of *Ennomos illunaria*, the male moth only is slightly sprinkled with atoms, and the ground colour is a yellow varying into rose-red; on the under side, the brighter lines are rose-red instead of white; the female, instead of grey-green, is ochre-yellow; the lines of the under wings rusty-yellow, often scarcely observable, and the fringes of all the wings are a lively rust-yellow; both sexes also are somewhat smaller. A similar proportion is found in *illustraria*. He is inclined to consider *delunaria*, Hüb., as a corresponding variety of *lunaria*.

Freyer (Beitr.) has figured the following, with the caterpillars and pupæ: *Boarmia sociaria*, Hüb., found on *Spartium scoparium* (t. 348); *Acidalia certartia*, Fr. (*cervinata* and *certata*, Hüb.), on the barberry, the caterpillar very unlike the *A. dubitaria*, Fr. (*dubitata*, Hüb.), the fly of which it closely resembles; it lives on white and black thorns (t. 402); *Acid. dilutaria* (t. 408).

Some new species from West Russian Asia have been made known by Eversmann (Bull. Mosc. 1842, p. 556), and Freyer (Beitr.): *Ennomos effractaria*, *sareptaria*, Fr. (t. 353); *Fidonia badiaria*, Fr. (t. 354); *Gnophos lapidisaria*, Fr. (t. 353); *Acidalia albidentaria*, Fr. (t. 354); *A. stramentata*, *appensata*, *affectata*, Ev.; *Cidaria pulchraria*, Ev. (t. 6, f. 9, Fr. p. 390); *Zerene albidata*, Ev. (t. 6, f. 10).

Zerena fasciaria and *Eubolia indicaria*, Guérin (Deless. Souv. ii. p. 96, t. 26, f. 5, 4), are two new *Geometridæ* from the Nilgherries.

PYRALIDÆ.—Some new species, from West Russian Asia, have been described by Eversmann (Bull. Mosc. 1842, p. 558): *Herminia rectalis*, *Pyralis noctualis*, *Botys languidalis*, *Choreutes pullulalis*, *Pyrausta atro-sanguinalis*, *peltalis* (t. 6, f. 11), *furvalis* (f. 12), *arundinalis* (f. 13), *Hercyna scabralis*.

TORTRICIDÆ.—Fischer von Rösslerstamm (Abbild. t. 98), has given an exact representation of *Tortrix lævigana*, W. Vz. Eversmann (Bull. Mosc. 1842, p. 562) has described *Tortrix gilvana* and *hydrargyrana* (t. 6, f. 14), from West Russian Asia.

TINEIDÆ.—Freyer (Beitr. 378–384) has separated from each other the nearly allied species of *Ypomeneuta*: *helicella*, Fr. (*rorella*, Hüb.), *padella*, *malinella*, *cognatella*, *evonymella*. He has also (ibid. t. 404) figured a new species, *Phycis wagnerella*, from Turkey.

Fischer von Rösslerstamm (Abbild. Pt. 20) has illustrated *Lita terella*, W. Vz., *Rhinosia juniperella*, L., *Palpula rostellata*, Hüb., and the following new species: *Lampros monasticella*, found on high hills at Vienna; *Elachista treitschkiella*, at Vienna, flying over the *Cornus mascula*; *Xpsolophus dolosellus*, *binotellus*, *separatellus*, *impirellus*, also from the neighbourhood of Vienna.

The same author (Ent. Zeit. p. 200) has also shown, that many species have been confounded under *Ochsenheimeria* (*Phygadeuon*) *taurella*, which he has carefully separated and amply described: *O. taurella*, W. Vz., and *urella*, Heyd. (new species), have rough scaly antennæ: *vaccullella*, Heyd. (*taurella*, Hüb. f. 188), has smooth ones; the last has been confounded with the true *taurella*, W. Vz., by Treischke, Duponchel, and Zeller; a fourth species, still more deviating, but allied to *taurella*, is *O. bubalella*, Hüb. f. 376 (erroneously 276). The earlier states of all the species are unknown.

The history of the development of the *Gelechia lapella*, Linn., has been given by Loew (Entom. Zeit. p. 257), and a very full description of the fly by Zeller (ibid. p. 259). The latter is of importance, as the insect varies greatly. The fly of the same name of the Vienna Catal., Hübner, Fabricius, and Stephens, belongs to *Tin. ganomella*, Tr. On the other hand, *Gel. æstivella*, Mtn., Zell., is identical with *G. lapella*, Linn. Loew found the caterpillar in the heads of burs; but Zeller found the fly in places where no burs were near, where, therefore, the caterpillar must, in all probability, have had some other nidus.

Von Heyden spoke, at the meeting of Naturalists at Mainz, upon the genus *Nepticula*, Heyd., and *Fischeria*, Zell. To the former belong *T. aurella*, F., *argentipedella*, Zell., *centifoliella*, Heyd., *sericopeza*, Zell., *sociella*, Heyd. Their caterpillars have only two pairs of incomplete legs, and six pairs of abdominal prolegs. The caterpillar of the *N. centifoliella*, already known by Degeer and Göze, has lately erroneously been taken for a parasitical larva. In some species the caterpillar has not arrived at its full growth in autumn; when the other leaves wither, these still retain their necessary nourishment, so that the cellular tissue in the circumference of their habitation remains green. The caterpillars of *Fischeria* are quite destitute of feet (Amtl. Bericht., &c. p. 208).

Eversmann has described some new species from the west of Russian Asia (Bull. Mosc. 1842, p. 563): *Chilo acutellus*, *Phycis equalidella*, *propinquella*, *Adela aurofulvella*.

Guérin and Perrotet have laid before the Parisian Academy a paper

upon a moth, *Elachista coffeella*, which is very injurious to the coffee plantations on the Antilles. The caterpillars mine into the leaves of the coffee, where, after they have fed from fifteen to twenty days, they spin themselves up, three or four in each leaf, and in about a week come out from the pupa, so that forty to forty-five days may be reckoned for one generation (Institut. p. 185; see also Rev. Zool. p. 24, 126, 167).

DIPTERA.

LEON DUFOUR has published some general remarks on the internal structure of the *Diptera* (Institut. p. 169).

According to his account, the cord of nerves uniting the chain of ganglions, is here simple, while in other insects it is double; he found the number of ganglions in *Tipula*, *Culex*, *Asilus*, and *Bombylius*, to be nine; in *Tabanus*, *Stratiomys*, and *Rhagio*, seven; in *Syrphus*, three; in *Conops*, two; and in *Musca*, only one.

A new work by Zetterstedt, "*Diptera Scandinaviæ*, 1 tom. Lund. 1842, 8vo.," is important, partly from the considerable number of new species, and partly by the proposed divisions, in which he has taken a step well worthy of attention; however, it is rather uncertain, the author having confined his view to the Scandinavian species. The natural characteristics, either of genera or families, cannot be determined, without examining the group in its whole extent and development.

An "*Übersicht der Zweiflügler Lief-und Kurlands*," has been published by Gimmerthal (Bull. Mosc. p. 639). An appendix contains remarks on the recorded species, and descriptions of those newly discovered.

"*Dipterologische Beiträge*," by Zeller (*Isis*, p. 807), contain excellent observations and descriptions of several newly discovered species.

Macquart's *Diptères Exotiques*, vol. ii. part 2, Paris, 1842, will be considered.

Le Guillou has described the new *Diptera* (seven species) collected by him in his voyage round the world (Rev. Zool. p. 314).

Patterson has made some observations on the appearance of clouds of *Diptera* (Ann. Nat. Hist. x. p. 6).

CULICIDÆ.—*Culex australis* of the reporter is a new species from Van Diemen's Land (Arch. 1842, i. p. 270).

CHIRONOMIDÆ.—Zeller (*Isis*, p. 807) has given his observations on the habits of the *Hydrobænus lugubris*, Fries (*Psilocerus occultans*, Ruth., *Chironomus occultans*, Meig.) These small gnats appear in masses, in the beginning of spring, on puddles and ditches. They sail on the water with their wings, but never fly.

CECIDOMYZIDÆ.—Professor Henslow has drawn attention to a doubtful point in the natural history of the *Cecidomyia tritici*, viz.,—Whether the larva undergoes metamorphosis in the ground, or if it remains in the ears of corn. He was not able to rearing one individual of the numerous larvæ which he procured from the sifting of the chaff. (Report of the Eleventh Meeting of the British Association for the Advancement of Science, held at Plymouth in July, 1841. London, 1842, p. 72.)

Edw. Herrick (Sillim. Amer. Journ. of Science, xli. p. 153) has made some cursory observations on the Hessian Fly (*Cecidomyia destructor*), and its parasites. The author is of opinion that the insect was, in fact, introduced from Europe; and produces much evidence that it is found native there. Its parasites are small *Hymenoptera*; viz.,—1st, A still undescribed *Platygaster*: 2d, *Ceraphron destructor*, Say, which the author thinks is a *Eurytoma*; apterous individuals are found, which are perhaps female: 3d, An undescribed species of *Chalcididæ*, also having apterous females: 4th, An undescribed *Oxyure*. The first species lives in the eggs, the others in the nymphæ.

TIPULARIDÆ.—Zeller (Isis, p. 808) has given an exact description of the larva of the *Limnobia distinctissima*. It was found in May on the under side of the leaves of the *Anemone nemorosa*, in which it eats oblong holes.

Stäger (Kröyer Naturh. Tidsskr. iv. p. 202) discovered the larva of *Dixa nigra* in a pond. It is brownish-grey, 2''' long, cylindrical; the middle thoracic ring broader than the rest; and a pencil of fine bristles projecting over the head, at the anterior projection (vorderecke); the last ring not longer and narrower than the rest, ending in two finely fringed lobes, between which is found a three jointed process, covered at the point with bristles; the lobes of the tail serve as suckers; the fourth and fifth rings of the abdomen have each a couple of sucking pads on the under side; the larva moves by means of this sucking apparatus and of the mouth. The nymphæ is reddish-brown, which state lasts four or five days.

A new genus, *Pterelachisus*, has been characterized by Rondani (Guér. Rev. Zool. p. 243; Mag. de Zool. 1842, Ins. pl. 106): Antennæ thirteen-jointed, the joints from the third reniform (judging from the plate), the last small and spherical; palpi as in *Tipula*; the wings reduced to small stumps; legs not very long. The male is unknown. *Pt. Bertei* is found in autumn on the Parmasian Hills, in the walls of old buildings.

The reporter has described a new species from Van Diemen's Land, *Megistocera pacifica* (Arch. 1842, i. p. 270).

HIBIIDÆ.—A new genus, *Asthenia*, has been characterized by Westwood (Guér. Mag. de Zool. 1842, Ins. pl. 94). He places it near *Macropseza*, *Sphæromias* and *Hydrobanus*; but the large eyes, which are close together above, point out a near alliance to *Simulium*, from which

the new genus differs by the wing-veins, elongated legs, fifteen-jointed antennæ and five-jointed palpi. The representation of a pair of broad dentated mandibles, serrated internally, originates in an error; at least they are wholly without example in this division of the *Diptera*. The species, *A. fasciata*, is from Albania.

Zeller (Isis, p. 800) has described the larva of the *Penthetria holosericea*; it is found on moist land, under the grass, fallen leaves, &c. It is $\frac{1}{2}$ " long, black, with four rows of spines above directed backwards, four rows of small adpressed spines beneath, and a black shining head; it changes in April into a black spinous nymph. He has (ibid. p. 811) united *Bibio clavipes*, Mg. (*Johannis*, F., *ephippium*, Zell.), as the male to *B. dorsalis* and *flavicollis*, Mg. *B. fulvicollis*, Gimmerthal (Bull. Mosc. 663), appears to be a variety of this species.

TABANIDÆ.—Zeller (Isis, p. 812) has made some valuable remarks on the species observed by him. He also describes several new ones: *Tabanus sudeticus*, very near the *T. bovinus*; *T. tricolor*, a very pretty species from South Russia; *Chrysopa parallelogrammus*, like the *Chr. relictus*. Zetterstedt (Dip. Scand.) has described several new Swedish species: *Tabanus latifrons*, *atricornis*, *flaviceps*, *nigricornis*, *nigerrimus*, *maculicornis*, *sublunaticornis*. The reporter (Arch. 1842. i. p. 273) has described three new species from Van Diemen's Land: *Tabanus exulans*, *gregarius*, *gentilis*.

ASILIDÆ.—Zetterstedt (l. c.) has enriched this family with three new species: *Laphria lapponica*, formerly considered as a variety of the *L. rufipes*, from which it differs by the black fore-legs, and in other respects; from the south of Lapland. *Dasypogon luteicornis*, from the south of Sweden. *Leptogaster cultriventris*, found in Sweden and Denmark.

Lampria claripennis (!), Le Guillou (Rev. Zool. p. 314), is also a new species, from Triton Bay.

MIDASIDÆ.—Harris (Ins. of Massachusetts, p. 406) has given some information on the natural history of these insects. The larva and pupa generally resemble those of the *Asili*. The former is cylindrical, narrowed anteriorly, rounded posteriorly, and lives in rotten wood. In the latter, the abdomen terminates in a forked point, the head has eight horns, and round each ring there is a series of small teeth, directed backwards, though at first they point forwards. The fly is described as being predatory.

XYLOPHAGIDÆ.—Drewsen (Krøyer Naturh. Tidsskr. iv. p. 103) has remarked, that the larva of *Xylophagus ater* does not live on wood, but is predatory; and that the larva of *Pyrochroa coccinea* and *Tipula*, especially, were attacked by it.

LEPTIDÆ.—Zetterstedt (Dipt. Scand.) has introduced a new genus into this family: *Nolina*, Stäg., for the species of *Atherix*, with the last

antennal joint oval, and having a bristle at the end, containing: *A. obscura*, Mg., and a new species, *A. nigra*. *Leptis stigmatica*, *ephippium cinerea*, *Chrysopila lata*, are new species.

Thereua and *Psilocephala*, Zett., differing from *Thereua* by the bald under part of face (containing *Th. imberbis*, Pall., *confinis* and *cæmia*, Mg., *lapponica*, Zett.), he places with the *Anthracidæ*. His *Th. annulata* is a new species from the south and middle of Sweden. *Th. venusta* of the reporter (Arch. 1842, i. p. 272) is another, from Van Diemen's Land.

BOMBYLIIDÆ.—Zetterstedt (Dipt. Suec. p. 190) has mentioned a new species, *Bombylius albibarbis*, which is nearly allied to the *B. minor*, but double the size, and distinguished by the long third joint of its antennæ and black knees.

Westwood (Güérin Mag. de Zool., Ins. pl. 90) has given a short monograph on *Systropus*, Wd. To the two species described by Wiedemann, he has added three new ones: *S. fœnoides*, from Mexico; *S. fumipennis*, from Brazil; *S. eumenoides*, from the North of India. The Berlin collection possesses a species from Brazil, which agrees with *S. fumipennis* in the black anterior thighs, but the posterior are very thick, which is not mentioned by Westwood; it is, therefore, probably different. We also possess an undescribed species from South Africa.

HYBOTINIDÆ.—Stäger (Kröyer Naturh. Tidskr. iv. p. 98) has sifted the synonymes of the species of *Ocydromia*: *Oc. flavipes* and *ruficollis*, Mg., are ♂ and ♀ of one species, and form the genus *Leptopeza*, Macq.; *Oc. rufipes*, Mg., he considers as a distinct species, of which the ♂ is still doubtful; *Oc. scutellata*, Mg., is only a bright variety of the *O. glabricula* (♂), Fall., to the ♂ of which, also, *O. dorsalis* and *nigripennis*, Mg., and *melanopleura*, Loew, are joined.

Zetterstedt (Dipt. Scand.) has characterized a new species, *O. nigripes*, found once in Öland; also of *Leptopeza*: *tibialis*, *borealis*, from Lapland; *flavimana*, *nigripes*, from Norway. Of *Hybos*: *infuscatus*, Stäg., from Lund. Of *Ædalia*: *stigmatella*, distinguished from *Æ. hybotina* by the undivided margin of the mouth. Gimmerthal (Bull. Mosc. p. 665) has mentioned *Ædalia pennata* as a new species, which has the posterior thighs feathered on each side.

TACHYDROMIDÆ.—Zetterstedt (Dipt. Scand.) has characterized a new genus, *Phyllodromia*, differing from *Hemerodromia* only by the long antennal bristles, containing *H. melanocephala*, F., *vocatoria*, Fall., and *albiseta*, Zett. For the greater number of the new species in this family, I refer to the work itself. Gimmerthal (Bull. Mosc. p. 667) has described *Tachydromia brunnipes* as a new species.

EMPIDÆ.—A number of new species of the genera *Hilara*, *Wiedemannia*, *Empis*, and *Rhamphomyia*, are described by Zetterstedt (Dipt. Scand.) Stäger (Kröyer Naturh. Tidskr. iv. p. 102) has remarked,

that the length of the proboscis in *Empis* and *Rhamphomyia*, cannot, as is often done by Meigen, be referred to difference of sex, as the membranous sheath, which surrounds the opening of the mouth, sometimes bulges out in the struggles of death, by which the proboscis is unnaturally lengthened.

DOLICHOPIDÆ.—An excellent monograph on the Danish *Dolichopidæ* has been undertaken by Stäger. The first part only has at present appeared (Krøyer Naturh. Tidskr. iv. p. 1), embracing the *D. lamelliferi*, with leaf-like appendages to the male organs of generation. The author, in this work, has brought to light, and taken as a foundation, the admirable treatise of Stannius (Isis, 1831). *Sybiestroma* (three species) and *Ammobates* (three species) are each enriched with one, and *Dolichopus* (forty-one species) with nine new species. He has given a plan for dividing the *Dolichopidæ* with filiform appendages to the male organs of generation (ibid. p. 340), which, as the genera are grouped according to the antennal bristles, corresponds, in general, with the division of Macquart; however, it is more carefully elaborated, and he has better sifted the genera, *Argyra* and *Porphyrops* especially. It is to be hoped the author will soon publish the remainder of this plan in the second part of his monograph.

Zeller (Isis, p. 831) has made some remarks on different *Dolichopidæ*. He has given the name *Sciapus* to the genus *Psilopus*, Meig., as *Psilopus* and *Psilopa* cannot well stand next each other. Four species have been more minutely examined by him; the ♀ of *Sybiestroma nodicornis*, Mg., is described, and a new species, *Dolichopus pectinifer*.

Macquart (Dipt. Exotiq.) has described a series of new extra European species of this family, of the genera *Psilopus* and *Dolichopus*. The reporter (Arch. 1842, i. p. 273) has also made known a new species from Van Diemen's Land, *Psilopus ingenuus*.

STRATIOMYDÆ.—Macquart (Ann. d. Soc. Ent. d. Fr. p. 41, t. 4, f. 2) has characterized a new genus, which has, in common with *Beris*, the eight-ringed third antennal joint, and with *Stratiomys* the long first antennal joint and double-spined scutellum, but is distinguished by the under part of face forming a strong projection, which receives the proboscis in an emargination; hence its name, *Exochostoma*. The only species, *E. nitida*, black, with yellow tibiæ, blackish wings, $2\frac{3}{4}$ " long, has been discovered in France.

Zeller (Isis, p. 825) has described a new species of *Sargus* from Hungary, *S. melampogon*, nearly approximating the *S. formosus*, Schr., but distinguished by the black beard and blackish wings.

Zetterstedt (Dipt. Scand.) has described the following new species:—*Stratiomys ruficornis*, chiefly distinguished from *St. hydropota* by the red antennæ, black only at the extremest tip; *Nemotelus notatus*; *Pachygaster tarsalis*; *Chrysomyia cyaniventris*; *Sargus nubeculosus*,

differing from *S. cuprarius* by its smaller size and dark base of the tarsi, which, in the other, are yellow; *S. nigripes*, which, however, better agrees with *S. nitidus*, Meig., than the one defined as such by the author, remarkably differing in size, &c.

The larva of *Clitellaria ephippium* has been found out by Zeller; it is very similar to that of *Sargus*. (Isis, p. 826, t. 1, f. 35.)

The reporter (Arch. 1842, i. p. 272) has described a new species from Van Diemen's Land, *Odontomyia stricta*.

SYRPHIDÆ.—Schummel (Arbeit. der Schles. Ges. für Vaterl. Kult, 1842, p. 15) has continued his list of the *Syrphidæ* observed in Silesia, embracing the genera *Paragus*, *Ascia*, *Sphegina*, *Baccha*. *Par. dispar*, *Sph. elegans*, *Baccha nigricornis*, are new species.

Gimmerthal (Bull. Mosc. p. 668) has characterized two new species of *Paragus*: *P. albipes* and *nigritus*, the former of which appears to agree with the ♂ of the *P. dispar*, Schumm.; also (p. 670) one new species of *Cheilosia*: *Ch. atra*.

Stäger (Kröyer Naturh. Tidsskr. iv. p. 320) has distinguished with great care and exactness the Danish species of *Platycheirus*, Enc. (subgenus of *Syrphus*) from each other. The species are,—1. *manicatus*, Mg. (?); 2. *peltatus*, Mg.; 3. *scutatus*, Mg.; 4. *clypeatus*, Mg.; 5. *quadratus*, Macq. (?), the ♀ is recognisable by the bluish forehead, narrow pointed abdomen, want of the four pairs of spots, &c.; 6. *scambus*, Stäg., (*Sceuv. clypeata*, var., Zett. Ins. Lapp.), distinguished as a species by its greater size, yellow anterior legs with long black bristles, fringeless middle tibiæ of the ♂ crooked and somewhat hollowed internally; 7. *fulviventris*, Macq.; 8. *albinus*, Mg.; 9. *Ocymi*, Mg. (♂ *lobatus*, Mg.)

Zeller (Isis, p. 830) has remarked, that the genus *Doros* has not as yet been distinguished from *Syrphus* by any character which is universally applicable.

Zeller (Ent. Zeit. p. 65) has drawn evidence, from cases of mixed union observed by himself, in favour of the view taken by Macquart, of the identity of the *Volucella plumata* and *bombylans*. The reporter (ibid. p. 113) has shown the same, by the description of the varieties found in the Berlin collection, of which the first (*bombylans*) passes, by four intermediate steps (among which is *hæmorrhoidalis*, Zett.), gradually into the sixth (*plumata*), which, by a seventh variation, is brought back to the first (*bombylans*).

The history of the metamorphosis of the *Volucella inanis* has been investigated by Schmidt (ibid. p. 20). He found the larvæ in September in a wasps' nest, both in the brood-cells and in the exterior coverings. When the whole wasps' nest was put into a glass half filled with earth, the larvæ went into the earth, remained in it until March, and in April became pupæ. This larva has also been found by Guérin and Lepelletier in wasps' nests, but was confounded with the *V. bombylans*

observed by Reaumur in the nests of humble-bees, which, even as a larva, is specifically distinct.

The larva of the *Syrphus albostrigatus* has been minutely described by Zeller (Isis, p. 828).

Mäoquart (Dipt. Exotiq.) has described a considerable number of extra European species, and, at the same time, characterized many new genera: *Mixogaster*, agreeing with *Ceratophya*, Wd., in the form of the antennæ, but differing by having the wing-veins and the form of body of *Conops*; the only new species, which is from the Brazils, should therefore be named *M. conopoides* (not *conopsoides*). Under the genus *Megaspis*, *E. chrysophygus*, Wd., and *E. crassus*, F., are separated from *Eristalis*, on account of the size of their scutellum. *Plagiocera*, differing from *Eristalis*, by the transverse last antennal joint, containing *Milesia cruciger* and *ruficrus*, Wd., which the author considers as varieties of each other, and to which *Mallota milesiformis*, Macq., Suit. à Buff., belongs, is correctly removed from the *Milesia* and placed nearer *Eristalis*. *Dolichogyna*, with one new species, *D. fasciata*, from Chili, much resembles *Helophilus*, but differs by the broader third antennal joint, the under part of face arched in its whole breadth, and particularly by the great length of the male organs of generation, to which the name refers. *Imatisma* (a name already used by Dejean), differing from *Eristalis* by the open marginal cells of the wings, from *Helophilus* by the thick cuticle of the middle part of the body, from *Mallota* and *Merodon* by the form of the third antennal joint, &c., is formed from the *Eristalis posticatus*, F., and includes a new species, said to be East Indian, *I. orientalis*.

The reporter (Arch. 1842, i. p. 272) has described a new species, *Eristalis vesicularis*, from Van Diemen's Land, and Le Guillou (Rev. Zool. p. 314) another, *E. splendens*, from the Solomon Islands.

CONOPARIDÆ.—Zeller (Isis, p. 835) has published his observations on the species of this family.

Conops soleaformis is a new species characterized by Gimmerthal (Bull. Mosc. p. 672).

Von Heyden remarked, at the meeting of Naturalists at Mainz (1842), that the larva of *Myopa* lives in the body of *Eucera* (Amtl. Bericht, &c. p. 209). The particular species of *Eucera* which is referred to, as well as of *Myopa*, is not stated.

ŒSTRACIDÆ.—Some observations on the *Œstridæ* have been made by Sells, in the Transact. Ent. Soc. iii. p. 72. He does not assent to the assertion of Clark, that the effect of the larvæ of *Gasterophilus* is salutary; on the contrary, when present in abundance, they destroy the health of horses; and in two cases of horses, which had died suddenly, the coats of the stomach were found, on dissection, to be perforated by these larvæ. Farther observations (p. 76) are given on *Œstrus bovis*, to which, as a synonyme, *Œ. ericetorum*, Leach, belongs.

Zeller (Isis, p. 839) has given a minute description of the *Cestrus stimulator*, Ol., with the well founded remark, that it is identical with the Lapland *C. trompe*, F.

MUSCARIDÆ.—A number of new species of different genera have been characterized by Gimmerthal (Bull. Mosc.): *Sarcophaga albipennis*, *Lucilia violacea*, *Pyrellia fasciata*, *Hylemyia flavescens* and *albolineata*, *Sapromyza 9-punctata*, *Cephalia 4-punctata*, *Phora quadrata*.

The species described by Guillou (Rev. Zool. p. 315), are, *Phrissopoda cyanea*, from Tahiti; *Sarcophaga propinqua*, from the Isle of France, Isle of Bourbon, and St. Helena; *Calliphora dasyophthalma*, from the Auckland Islands, and *C. magellanica*, from the Straits of Magellan, both very like the *C. vomitoria*, but the former is distinguished by rough eyes, the latter by yellow cheeks and palpi with black tips; *Musca oceanica*, from different parts of the South Sea, distinguished from *M. corvina* by yellowish halteres and the almost straight transverse nervures of the wings.

Rutilia speciosa of the reporter (Arch. 1842, i. p. 273) is a new species from Van Diemen's Land.

Zeller (Isis, p. 840) has published an important contribution to our knowledge of the species of *Gonia*. He has enriched that genus with three new species, in addition to the *G. fasciata* and *divisa*, Mg.: *G. trifaria* (perhaps identical with *G. capitata*; Mg., but different from *G. capitata*, Deg., Fall.), *G. lateralis*, and *G. simplex*, all from Silesia.

According to a communication, made by Von Heyden, at the meeting of Naturalists at Mainz (1842), the larva of *Gymnosoma* lives as a parasite in *Pentatoma* (Amtl. Bericht., &c., p. 209).

Stäger (Kröyer Naturh. Tidssker. p. 319) has distinguished three species, confounded under *Atomogaster triquetra* (*Anthomyia triq.*, Wd.): *A. Macquarti* (*triquetra*, Macq.), *tibialis* and *triquetra*, Wd., Mg., Fall.; the last differs, by shorter antennæ, two spines on the middle thighs, and smaller size; the others have longer antennæ, and only one spine on the middle thighs; the second has the anterior tibiæ and the middle tarsi yellow.

Waga (Ann. d. Soc. Ent. d. Fr. xi. p. 277, t. 11, f. 13-17) has characterized a new genus, *Adapsilia*, which is allied to *Sepedon* and *Tetanocera*; with the former it agrees in the greater length of the second antennal joint, but the posterior thighs are not thickened, the abdomen in the ♂ is oval, in the ♀ "compressed conical:" *A. coarctata*, reddish-yellow, with brown spotted wings, was discovered at Warsaw.

De Brême (Ann. d. l. Soc. Ent. d. Fr. xi. p. 183, pl. 7, f. 2) has characterized a new species of the genus *Ceratitis*, MacLeay; he has shown that *C. citriperda*, MacLeay, is identical with *Trypeta capitata*, Wd., for which Macquart has formed the genus *Petalophora*, and that the old species, which is found in the Canary Islands, Isle of France, and the

East Indies, must be named *Ceratitis capitata*; the new species *C. hispanica*, Br., is from Andalusia, and should be distinguished from the older species by the shorter length and deeper setting of the lobed bristles of the forehead, which form the chief characteristic of the genus, as well as by the black colour of the lobes, which in the other are whitish. These distinctions appear to me doubtful; Wiedemann gives the colour of the lobes expressly as black, which my observations confirm, and I can find no other difference between *C. capitata*, from the Isle of France, and a specimen from Sicily, than that these bristles in the latter are somewhat shorter, and not so remarkably long as the author has given them; it might be held as an individual difference.

Bachmann (Ent. Zeit. p. 263) has made some remarks upon *Trypeta signata*, Mg., the larva of which lives in the substance of sweet and bitter cherries; and, according to C. Wagner's observation, is found in the fruit of the *Lonicera xylosteum*.

Von Siebold (Germ. Zeitschr. iv. p. 389, t. 1, f. 1-3) has remarked black protuberances on the abdomen of *Bacillus Rossii*, which proved, on more minute examination, to be the forked breathing processes of the orange-yellow larva of a fly, 4''' long, sticking in the body; he did not succeed in rearing these parasitical larvæ.

PUFIPARA.—The reporter (Arch. 1842, i. p. 274) has described a new species from Van Diemen's Land, *Ornithomyia nigricornis*.

HEMIPTERA.

A PECULIAR apparatus, for connecting the anterior and posterior wings in the *Hemiptera*, has been discovered and described by Ashton (Transact. Ent. Soc. iii. p. 95). In *Notonecta glauca* are found, on the under side of the anterior wings, at the posterior margin, two small horny projections, which together form a small tubular channel. A minute projection of the rib-like thickened anterior margin of the posterior wings is bent upwards and backward, and grasped in this channel. In *Centrotus cornutus*, a small portion of the anterior margin of the posterior wings, is turned upwards, and from this springs a small horny process, directed backwards, which fits into a recess of the posterior margin of the anterior wings, the edge of which, at that point, is bent down and reflected forwards, forming a small channel for the reception of the above process. The small process of the posterior wings is finely dentated. The former kind of fastening, which is the firmer, appears peculiar to the *Heteroptera*, the latter to the *Homoptera*; in the former, the position of the process is at the union of the horny and membranous portion of the hemelytra, in the latter at the point of the last nervure of the anterior wings.

PENTATOMIDÆ.—Schiodte (Krøyer Naturh. Tidsskr. iv. p. 335) has explained his views on the presence of the clasping pieces in the *Pentatomidæ*. In one, they are only present in the male, viz.,—*Stiretrus*, Lap., also *Asopus*, with abdominal bristles and dilated anterior tibiæ (*Oplomus*, Spin.), *Scutellera*, Germ., *Cæloglossa*, Germ., *Arctocoris*, Germ.; in the others, they are found in the males and the females, viz.,—*Psacasta*, Germ., the proper *Pachycoris*, Burm., and the African forms of *Halys*, as *H. serrata*, F., and *cincta*, Herr., Schæff. (which, as Schiodte remarks, are different). He has also (ibid. p. 279) illustrated the Fabrician species of *Tetyra*, contained in the royal collection at Copenhagen, by copious and exact Latin descriptions. The synonymy has been subjected to a thorough revision. This is an excellent work, from which I can here only give the cursory remark, that the author rejects the generic names *Calliphara* and *Callidea*, as interfering with *Culliphora*, Macquart, and *Calleida*, Dej., and substitutes for them *Philia*. Adam White (Transact. Ent. Soc. iii. p. 85) has felt the same necessity, from the similarity of the latter name to *Callidium*, and proposes to substitute for it Hahn's name, *Chrysocoris*.

Adam White has commenced his labours on the *Hemiptera*, collected by Cuming on the Philippines, by describing the new *Pentatomidæ* (Gray, Zool. Misc. ii. p. 79): *Callidea sellata* with the variety *chromatica*; *C. speciosa*, *dorsalis*; *Plataspis xanthogramma*, *Mungo*, *Scipio*. The treatise here breaks off, and it is to be regretted, that the size of the three species of *Plataspis* is omitted, as their definition is not easy without it, and it would be as well to append it to the continuation of the work. He has also described a new species from Sierra Leone (Entom. p. 406), *Probenops dromedarius*; it is distinguished as a new genus, by the protracted head, the prothorax forming a projection anteriorly, which may be compared to that of the *Notoxus monoceros*, and a very broad scutellum, which covers the whole abdomen; the tibiæ are without spines; the tarsi seem two-jointed; it is placed provisionally next *Podops* and *Coptosoma*. The same author has also described (Trans. Ent. Soc. iii. p. 84) several new *Hemiptera*, among which are the following:—*Tectocoris Childreni*, from Nepal, for which, and *T. Druræi*, *Hardwickii*, *affinis*, &c., he founds a peculiar sub-genus, *Pæcilochroma*, distinguished from *T. Banksii* and *cyanipes*, by having a shorter head, squarer in front, more compressed antennal joints; *Callidea (Calliphara) bifasciata*, from an island in the South Sea; *parentum*, from Australia (?); *Callidea examinans*, Burch., from South Africa; *C. fascialis*, from the East Indies; *C. Morgani*, from Sierra Leone; *Scutellera (Trigonosoma) interrupta*, from Teneriffe, differing from *Sc. lineata*, by having only three yellow longitudinal bands on the prothorax, the lateral of which are shortened anteriorly. He has founded a new genus, *Coleotichus*, for the New Holland *Tetyra costata*, F.,

which approximates *Tetyra*, Burm. (*Eurygaster*, Lap.), and *Pachycoris*, and its chief characteristic appears to be, that the thoracic groove for the proboscis, reaching to the hinder legs, gradually dilates posteriorly, so that its walls externally pass round the trochanter.

Another new genus, *Coriplatus*, White (ibid. p. 90, t. 7, f. 3), with one new species, *C. depressus*, from Demerara, is allied to *Sciocoris*, *Dinidor*, &c. It has a long scutellum, contracted in the middle, reaching to the end of the abdomen, and lobed lateral margins of the prothorax. He has also described (ibid.) *Dryptocephalus* (?) *Pertyi*, from Brazil, to which the sub-generic name, *Cephaloplatus*, has been given, as it differs from the others by the two-lobed head and much larger eyes; *Ælia* (?) *gracilis*, from Congo, with the long proboscis of an *Atelocera*, but with the second antennal joint cylindrical and not compressed; *Ælia* (*Megarhynchus*, Lap.) *cænosa*, from Gambia.

The reporter (Arch. 1842, i. p. 275) has noticed the following new species from Van Diemen's Land:—*Cydnus australis*, *sepulchralis*; *Asopus nummularis*; *Cimex incultus*; *Atelocerus labidus*, *grandicornis*; *Rhynchocoris ligata*.

Schiödt (Kröyer, Naturh. Tidsskr. iv. p. 237) has subjected the genus *Cephaloctenus*, Duf., to a very close examination; ocelli wanting; composite eyes present, but small and divided, one part on the upper, another on the under side. *C. histeroideus*, Duf., has been already described by Fabricius as *Cydnus scarabæoides*; this and a new species from Travancore, in India, *C. melolonthoides*, are carefully described.

Germar (Ent. Zeit. p. 68) has more correctly distinguished *Ælia* (*Pentatoma*) *acuminata*, F., and *Klugii*, Hahn, and drawn attention to a third species, nearly allied to the first, *Æ. pallens*, Küst., which seems abundant in the north, and may be the real *Cim. acuminatus*, L.

CORRIDÆ.—Germar (Faun. Ins. Eur. t. 11) has figured an insect from Turkey, under the name of *Aradus obscurus*, which, however, belongs to this family, and is most nearly allied to *Pseudophl. lobatus*, Herr. Schöff.; he describes the proboscis as three-jointed, and the ocelli as wanting, on which its generic name is grounded; in our specimens, I find four joints to the proboscis, and ocelli on the longitudinal elevations of the forehead directed laterally, and therefore easily overlooked, unless viewed from the side. He has also figured (ibid. t. 12) *Phyllo-morphus erinaceus*, from Turkey; which however had been made known (1841), under the same name, by Herr. Schöff. A new species of the same genus has been pointed out by Westwood (Arcan. Ent. i. Add. and Corr.), *Ph. pellicula*, from tropical Africa.

Adam White (Trans. Ent. Soc. Lond. iii. p. 92) has described several new species: *Spartocerus* (?) *erythromelas* from Brazil (it is *Sp. bicolor*, Herr. Schöff.), *Sp. dorsalis*, from Mexico; and *Cerbus* (*Derepteryx*)

Grayii, and *Hardwickii*, from Nepal. The sub-genus *Derepteryx* has the abdomen laterally dilated outside the hemelytra; the sides of prothorax much dilated and projecting anteriorly before the head.

The reporter (Arch. 1842, i. p. 278), has characterized a new species from Van Diemen's Land, *Hypselopus incarnatus*.

LYGÆITES.—*Lygæus mutilatus*, *Pachymerus lacertosus*, *torquatus*, and *nigroæneus*, of the reporter, are new species from Van Diemen's Land (ibid. p. 279).

CAPSINÆ.—*Phytocoris varicornis* of the reporter is also from Van Diemen's Land (ibid. p. 280). Adam White (Trans. Ent. Soc. Lond. iii. p. 93) has described *Calliprepes Grayii*, from Nepal, a new form of this family, which appears very aberrant; and *Eucercoris Westwoodii*, from Sierra Leone, from whence also *E. nigriceps*, Westw., has its origin, and whose locality has hitherto been unknown.

ARADIDÆ.—A new species, from Van Diemen's Land has been described by the reporter, *Aradus australis* (Arch. 1842, i. p. 281).

REDUVINI.—The reporter (ibid.) has enriched this family with two new genera: *Isodermus*, with an extremely flat body, no ocelli, and with lobes, for holding, between the claws, with one new species, *I. planus*; and *Dicrotelus*, resembling *Pygolampis* and *Stenopoda*, but differing, by dentated claws, &c., with one apterous species, *D. proluxus*; besides four new species, *Nabis geniculata*, *Pirates fuliginosus*, *Arilus australis*, *Emesa juncea*, all from Van Diemen's Land.

GALGULIDÆ.—*Mononyx suberosus* of the reporter is from the same place (ibid. 285).

FULGOREIDÆ.—Guérin (Deless. Souv. ii. p. 66, t. 16), has given splendid plates of *Fulgora Delessertii* and *subocellata* (see Report for 1839, p. 321). *F. rajah*, formerly characterized, is here shown to be identical with *F. pyrorhynchus*, Don.

Westwood (Ann. Nat. Hist. ix. p. 118), has published several new species, with short but clear descriptions: *Fulgora (Pyrops) Spinolæ*, allied to the *F. candelaria*, from Mysore and Assam; *guttulata*, from Northern India; *virescens*, from India; *F. (Episcius, Spin.?) amabilis*, from Mexico; *Eurybrachis insignis*, from Malabar.

The same author (Linnæan Transact. xix. p. 1) has published a very valuable paper upon the genus *Derbe*, F., of which previously only a very slight sketch was given (see Report for 1840, p. 242), and to which he has now appended several additions. The generic name, *Derbe*, is confined to those South American species which are of a stout form, have longer legs, a proboscis reaching to the middle of the abdomen, shorter antennæ, and longer naked wings; with them he places *D. hæmorrhoidalis*, F. ;*

* The *D. hæmorrhoidalis*, of the Berlin collection, differs from the generic type of Westwood, in the wing-veins, &c.

D. nervosa, of the Berlin collection (Stoll. f. 160), and two new species: *D. semistriata* and *strigipennis*, from Brazil.

A second genus, *Mysidia*, is formed of those species from South America which have a slighter form, shorter legs, a proboscis not reaching beyond the hind legs, moderately long antennæ, shorter and broader dusty wings. In this are *D. pallida*, F., Perch.; *squamigera*, *costalis*, *punctum*, *testacea*, *nivea*, F.; and three new species: *M. albipennis*, from Mexico (Vera-Cruz); *M. lactiflora* and *subfasciata*, from Brazil.—*Diospolis*, Westw. (formerly *Lydda*, Westw.), is a New Holland form, with a shorter proboscis, short antennæ, and long anterior wings, very narrow and rounded at the point: *D. elongata*, F., is the only species known, and is from New South Wales.—*Thracia*, Westw., with long antennæ (double the length of the head), three keels on the clypeus, and very long narrow anterior wings, truncate at the point, is founded on *D. sinuosa* and *nervosa* (*Bohemanni*, Westw.), Bohem., from Sierra Leone, to which is appended a Javanese species, *Thr. javanica*.—*Phenice*, Westw., comprehending *D. fritillaris*, *fasciolata*, and *stellulata*, Bohem.; clypeus as in the preceding; antennæ short; shorter anterior wings rounded at the point; also differing from all the preceding, by its longish remarkably emarginated eyes; ocelli distinct.—A couple of very small and extremely tender insects, from St. Vincent's, in the West Indies, approaching the genus *Anobia*, Kirby, form the genus *Patara*, Westw.; eyes large, emarginated beneath; ocelli indistinct; very large warty second antennal joint: *P. guttata* and *albida*, Westw.—*Cenchrea*, Westw., has large eyes emarginated beneath, below them are distinct ocelli; small antennæ with a roundish tuberculated second joint: one species *C. dorsalis*, Westw.—Lastly (ibid. p. 20) *Zeugma* is characterized, which, by its wing veins, occupies a position between *Derbe* and *Mysidia*, but (judging from the plate) differs by the keels of the forehead continuing on to the clypeus, and the posterior tibiæ having a spine in the middle: one new species *Z. vittata*, of unknown native country.

MEMBRACIDÆ.—One new species, *Smilia informis*, from Brazil, has been characterized by Westwood (Ann. Nat. Hist. ix. p. 119).

CICADIEDÆ.—Eversmann (Bull. Mosc. 1842, p. 797) has given a notice on the dropping willows of Orenburg. The cause of the drops was the larvæ of an *Aphrophora*, which very much resembled the *A. spumaria*, but was more oblong, and of a uniform yellow-grey. He names it *A. lacrymans*; it is, however, distinguished by Fallén, as *A. salicis*.

The reporter (Arch. 1842, i. p. 285) has described *Aphrophora albicincta*, and *Eurymela bicincta*, from Van Diemen's Land.

According to Harris (Ins. Mass. p. 184) *Tettigonia vitis*, Harr. Amer. Encycl. xviii. 43 (1" long, pale yellow, two stripes on the head; the

posterior part of prothorax, the scutellum, the root, a broad middle band and some stripes near to the blackish point of the tegmina, are red; head lunate; ocelli situated close under the ledge of the forehead), is very hurtful to the foreign as well as native vine. Another species, *T. Fabé* (pale green, tegmina and wings clear, the last joint of hinder tarsi bluish, head lunate, ocelli on the margin of the forehead), injurious to the Windsor bean.

STRIDULANTES.—Westwood (Arcan. Ent. i. p. 92, t. 24, f. 1), has characterized a new genus, *Cystosoma*, which differs most essentially from *Cicada*, in the abdomen in the male being swollen into the shape of a bladder, and the veins of the anterior wings forming, from the middle, sexagonal meshes: *C. Saundersii*, new species from New Holland. On the same plate figures are also given of *Polyncura ducalis*, Westw., and *Hemidictya frondosa*, Burm. (ibid. p. 97). Westwood has given an enumeration of the species of *Cicada*, with opaque anterior wings, and has increased them by two new species: *C. mearnsiana*, from the Himalayah, and *C. dives*, from Sylhet, which are beautifully figured on tab. 25. (See also Ann. Nat. Hist. ix. p. 118.)

The reporter (Arch. 1842, i. p. 286) has described a new species, *C. torrida*, from Van Diemen's Land. It may be noticed, that this species only appears in dry summers, and seasons of great heat and drought; and its song is heard during the greatest heat of mid-day.

PSYLLIDÆ.—Under the name of *Diraphia*, used by Illiger for *Livia*, Waga has characterized a new genus (Ann. d. l. Soc. Ent. d. Fr. x. p. 275, t. 11, f. 11, 12), which is very closely allied to *Livia*, and differs chiefly by the second antennal joint, which is much smaller (about one-fourth the length of antennæ), and simply oval. The anterior corners of the head, also, are not pointed but rounded: *D. limbata*, in bushes at Warsaw.

The reporter (Arch. 1842, i. p. 286) has described *Psylla luteola* and *subfasciata*, new species from Van Diemen's Land.

APHIDÆ.—Spence (Transact. Entom. Soc. of Lond. iii. p. 98) describes the ravages of these insects in the orchards of Devonshire. The injury, in his opinion, is done by the blossoms dying, in consequence of the leaves being sucked by these insects before their development.

Hofmann Edl. von Hofmannsthal has published a work, called *Die Caruba di Guidea*, Vienna, 1842. A plate in it represents the gall of *Pistacia terebinthus*, with the *Aphis* which inhabits it.

Harris (Ins. Mass. p. 190) considers the former of two *Aphides* found in Massachusetts to be *Aphis caryæ*, Harr.; a *Lachnus*, with a soft woolly black body, four rows of small transverse spots on the back, black wing-veins and reddish-brown tibiæ, $\frac{1}{4}$ " long; it sucks the branches of the *Carya porcina*. The other, *A. saliceti*; probably also a *Lachnus*, $1\frac{1}{2}$ " long, black, without spots; the short honey-knobs, the third antennal joint, the legs, and the veins of the transparent wings, ~~tan~~ yellow; it

lives, in masses, on the under side of the branches of different willows, and appears winged in October. The other species mentioned, seem to agree with the European; as one, which lives on the roots of plants (e. g. the Chinese aster), agrees with *A. radicum*; another, on peach trees, with *A. persicæ*, Sulz. The *A. lanigera*, Hausm., is also beginning to show itself in America, though not as yet very widely distributed.

THYSANURA.

WAGA (Ann. d. l. Soc. Ent. d. Fr. xi. p. 264, t. 11, f. 5-8) has made known a new species, distinguished by its size, under the name of *Achorutes bielaniensis*. It is a true *Podura*, and is placed beside the *P. armata*, Nic. It is found in the low grounds of the Forest of Bielany, on the bank of the Vistula, near Warsaw, in great abundance. The author remarks, that at first the young ones have no trace of the springing-fork, and questions whether the species of *Anurophorus* (*Lipara*, Burm.) may not be the young of this genus. Paul Gervais has made a new genus, *Anoura*, for the *Achorutes tuberculatus*, Nic., to which he has added a second species, *A. rosea*. The characters are not given. (Ann. d. l. Soc. Ent. d. Fr. xi. p. 47.)

PARASITA.

THIS order has been treated of by Denny in a comprehensive monograph, "Monographia Anoplurorum Britannicæ;" or an Essay on the British Species of Parasites, Lond. 1842, 8vo., with twenty-six coloured copper-plates. As the extensive researches of Nitzsch on the *Epizoa* do not seem to have been published, this work not only fills up an evident gap in entomological literature, but will also give an impulse to the investigation of these little regarded animals. The definition of species, of which a considerable number of new ones have been observed by the author, is well illustrated by engravings. The division into genera and sub-genera is that of Nitzsch, only there is a new sub-genus, *Nitzschia* (*N. Burmeisteri*, from the Swift), added under *Liotheum*.* Exact investigations on the parts of the mouth are unfortunately omitted. The author has been content to give again, in *Pediculus*, the erroneous figures of earlier observers.

Gurlt (Mag. f. d. ges. Thierheilk. 8 Jahrg. 4. st. p. 409, t. 4, und 9 Jahrg. 1. st. p. 1, t. 1) has given an excellent representation of the para-

* Nitzsch has already long had the honour—at least it is so intended—of lending his name to a genus of intestinal worms.

sitic insects living on our domestic fowls and mammalia. The plates are masterly, and although uncoloured, far excel those of Denny. Two new species have been observed by him: *Ornithobius anseris*, on the goose; and *Trichodectus capræ*, in the goat. .

FOSSIL INSECTS.

UNGER has made some remarks on the fossil insects in the clay slate of Radoboj, in Croatia (Verhandl. der Kais. Leop. Acad. d. Naturf. xix. ii. p. 415). They exceed all other fossil remains of animals, in the number of genera, species, and individuals, accompanied also by the traces of very many sorts of plants; and what is strange, fishes and their scales are found together with them on one and the same piece of slate; many of them exhibit marks of commencing putrefaction, while others seem as if the animal had been buried alive. *Hymenoptera* are most numerous, especially ants; next *Diptera*, *Coleoptera*, *Hemiptera*, and *Neuroptera*, and even the coloured wings of a butterfly have been found. He has given figures of several *Diptera*, viz.,—*Rhipidia extincta*, *major*; *Bibio Murchinsonis*, *gracilis*, *lignarius*, *giganteus*, *enterodelus*; *Leptogaster Hellii*. There is also an Essay by Charpentier (ibid. xx. p. 401, t. 21–23), “Über einige fossile Insecten aus Radoboj in Croatien,” in which are represented the remains of *Edipoda melanosticta*, *Myrmeleon brevipennis*, *reticulatus*; *Libellula platyptera*, *Sphinx atavus*, *Hylotoma (?) cineracea*, *Termes pristinus*. His remarks on the origin of these remains are worthy of attention, as they throw some light on the important geological question, what sort of catastrophe destroyed the former creation. These insects, in the author's opinion, belonged to the land and air; their tender parts are preserved in such a way, that the view of their having been swallowed up by a deluge cannot be maintained. It is rather to be assumed, that they have been killed by currents of air, and have fallen down, enveloped in a shower of dust and ashes, or been covered by a fine shower of slime; an examination of the place, and their position, may lead to a more certain conclusion. That they were destroyed during the catastrophe is probable, as dead insects, in the open air, are very soon consumed by other insects.

ARACHNIDA.

GRUBE has given some of the results of his researches on the anatomy of the *Arachnida* (J. Müller's Arch. f. Anat. u. Physiol. 1842, p. 296). They contain many important hints, among others, that the part

usually called the tongue, lies above the opening of the mouth, and therefore may be considered as the upper lip; that, at least in the *Argyroneta* and *Epeira*, minutely investigated by him, the ring form of the stomach is only apparent, and that it arises from the anterior extremities having their points lying immediately upon each other, without, however, communicating with [überzuziehen] each other; that the heart of the spiders and scorpions possesses lateral openings, and is surrounded by a membranous reservoir, with which it communicates through these openings.

The development of the *Lycosa saccata* has been observed by Rathke (Froriep. Notiz. xxiv. p. 165). A list of the *Arachnida* observed at Chusan has been published by Cantor (Ann. Nat. Hist. ix. p. 491); they belong to the genera *Attus*, *Thomisus*, *Hypoplatea*, *Lathrodectus* (?), *Uloborus*, *Tetragnatha*, *Epeira*, and *Phalangium*, and are, with the exception of the *Epeira fasciata*, Walk., considered as new, and shortly characterized.

ARANEÆ.

BLACKWALL (Ann. Nat. Hist. x. p. 407) has laid before the Linnæan Society of London his further observations on the British Spiders.

DRASSIDÆ.—Graells (Ann. d. l. Soc. Ent. d. Fr. xi. p. 205) has made some excellent observations on the Malmignatte (*Lathrodectus l3-guttatus*, Ross, *malmignatus*, Walk.), partly on its habits, and partly on its poisonous qualities; the Malmignatte is found principally in the district of Tarragona, in Catalonia, where, however, it was unknown previous to 1830, but became a nuisance in the years 1830, 1833, and 1841. It makes an irregular net in small hollows, by means of which, and its poisonous bite, it overcomes insects which are many times larger than itself; it also forms a neatly constructed cell, which is concealed beneath dry leaves, and serves as its lurking place. *L. oculatus* and *erebus* are found in the same places with the Malmignatte, and are of similar habits. The author remarks, that the Malmignatte years were also locust years.

MYGALIDÆ.—Numbers four to six of the ninth volume of the *Arachnida*, by Koch, contain only *Mygalidæ*, viz.,—*M. avicularia*, L., and *hirsutissima*, a new species from South America; *M. versicolor*, *zebra*, Walk., *diversipes*, *plantaris*, *anthracina*, *lycosiformis*, *detrita*, from Brazil; *plumipes*, from Surinam; *rosea*, Walk., from Chili; *læta*, *cæsia*, from Porto Rico; *drassiformis*, *incana*, from St. Thomas; *cafreriana*, *funebria*, Walk., from South Africa; *javanensis*, Walk., from Java; *uraina*, *convexa*, *felina*, locality unknown; also *Octinopus caffer*, from the Cape; *liricatus* from Mexico; *tarsalis* and *longipalpus* from Monte

Video; and a new genus, *Teratodes*, with long strong legs, very long palpi (♂), and a small but elevated prominence for the eyes, on the top and at the sides of which they are situated; with one new species, *T. depressus*, from Brazil.

DYSDERIDÆ.—Hentz (Sillim. Amer. Journ. xli. p. 116) has characterized a new genus, *Spermophora*; it has the eyes in two little clusters, so that three equally large stand on each side, close to each other; the legs are moderately long, thin, the first pair the longest, then the fourth and second almost of equal length; the mandibles short, spherical, with very small claws; it resembles *Pholcus* in the parts of the mouth, but has shorter legs, and only six eyes. *Sp. meridionalis*, found in Alabama, in dark places under rubbish; it makes a very loose web. The female makes no web; she carries about, in her mandibles, her eggs, glued to each other, until the young come out.

The genus *Argyroneta*, according to the excellent researches of Grube, approximates to the *Dysderidæ*, and will, perhaps, require to be characterized as a peculiar family; besides the pleura, it has tracheæ, which arise, pencil-shaped, from short stems opening behind the pleura, and have this peculiarity, that they do not ramify (J. Müller's Archiv. 1842, p. 300). In a very interesting treatise on the habits of the *Argyroneta aquatica* (Preuss. Prov. Blätter, 1842), the same author adds the important fact, that in these spiders, the distribution of vessels is confined to the abdomen, and is not to be found in the anterior part as in other spiders, so that the tracheæ in it occupy their place; probably the air which surrounds the spider, when it dives under water, comes out of the tracheæ. This air keeps off the water by a peculiar coating of varnish, and it disappears, according to the author's experiments, when scratched under water with a needle, and is not seen when the insect dives, if the varnish has been previously removed by the application of ether.

SOLIFUGÆ.

PHRYNIDÆ.—Van der Hoeven (Tidsschr. v. Natuurl. Geschied. en Physiol. ix. p. 68, t. 1) has made a careful examination of the genus *Phrynus*, partly having for his object the external and internal anatomy of the *Phrynus medius*. The following remarks are made on its internal structure:—The intestinal canal is straight, without lateral branches going to the liver or the pancreas [(?) Fettkörper], as in the scorpions. Of the sexual parts the author could give no account. The nervous system, so far as it lies in the cephalothorax, appeared to the author to consist of a large ganglion, from which radiated branches go off to the legs; a chord passes backwards, which divides, in the abdomen,

into two branches, from which filaments go off, at acute angles, to the different parts. The respiratory organs are situated, one pair between the first and second, and one between the second and third posterior segments of the body, and consist of about eighty folds lying close upon each other. Finally, he gives a copious and minute account of the species figured or described by different authors, among whom, however, we miss Koch, who, in the eighth volume of his "*Arachnida*," has figured a series of species (see Report for 1840, p. 246). It appears from this treatise, that the Berlin collection is very rich in this genus; and I shall not delay complying with the desire of the author, occasionally to give some information concerning them.

SCORPIONIDÆ.—In the first number of the tenth volume of his "*Arachnida*," Koch has figured the following new scorpions:—*Ischnurus melampus*, from the Cape; *Opisthophthalmus pallipes*, *ibid.*; *Væjovis nitidulus*, from Mexico; *V. carolinus*, from Carolina; *V. flavescens*, from Brazil; *V. asperulus*, from Mexico, probably identical with *V. mexicanus*; *Brotheas bonariensis*, from La Plata; *Br. nigrocinctus*, locality unknown; *Br. erythrodactylus*, from Brazil; *Scorpius oravitzensis*, from the Banat, nearly allied to *Sc. banaticus*; *Sc. naupliensis*, from Greece, very slightly differing from *Sc. italicus*.

Guyon (*Rev. Zool.* p. 17; *l'Insitut.* p. 43) has reported to the Parisian Academy, that there are four species of scorpions found near Algiers, and that the effects of the sting of *Sc. occitanus* are purely local, and disappear within twenty-four hours. In small animals, such as dogs, cats, and rabbits, the consequences may prove fatal. Moritz Wagner has given a careful account of the Algerine scorpions (*Reis. in Alger*, iii. p. 215–221); he has observed five species, and given an exact account of them, and of the different strengths of their poison.

OBISIDÆ.—A new species, *Chelifer Bravaisii*, from Algiers, has been pointed out by Gervais (*Ann. d. l. Soc. Ent. d. Fr.* xi. p. 46).

GALEODIDÆ.—Koch has given a systematic view of this family in these Archives (1842, i. p. 350), which has made known a great series of species, almost exclusively from the Berlin collection; they are divided into five genera, of which the most striking variation is in the number of the tarsal joints: *Solpuga*, Licht.; the second and third pairs of legs have four tarsal joints, the fourth have seven besides the heel joint: ten species, one from Egypt, and the others from the Cape. *Galeodes*, Ol.; the second and third pairs of legs have two joints, the last three: seven species, distributed between anterior India, South Russia, and Egypt. *Ællopus*; the three pairs of legs with two joints, the hindmost without claws: one new species from South Africa. *Rhax*, Herm.; a short unarticulated tarsus to all the legs, terminal joint of palpi concealed: four species, from Arabia and Egypt. *Gluvia*; longer and thinner unarticulated tarsi to all the legs, free terminal joint of palpi; seven

species, one from Portugal, the rest from Central America (to the latter, several species, figured in Guér. Mag. d. Zool., are to be added).

OPILIONES.

GERVAIS (Mag. d. Zool. 1842, Arachn. pl. 2-5) has described and figured two new species: *Gonyleptes planiceps*, Guér., from the Straits of Magellan, and *Stygnus inflatus*, Guér., from Cayenne; and characterized a new genus *Phalangodes*, which is nearly identical with *Pachylus*, Koch; defining also the species *Ph. anacosmetus*, perhaps from New Holland—it is probably the same as *P. granulatus*, Kolk, from Chili. There is also a species of *Cosmetidae* added, under the name of *Cosmetus flavicinctus*. It is not a true *Cosmetus*, as it has double protuberances on the hinder part of its back; but whether it be a *Flirtea*, or one of Koch's allied genera, is not certain, as the number of the tarsal joints is not noticed. It is found at Bogota, and is distinguished from the other *Cosmetidae* by the rough spinous hind legs.

ACARI.

Our acquaintance with this order has been essentially increased by Koch's "Übersicht des Arachnidensystems, 3 Hft. 1 und 2 Abtheil." These two numbers extend to *Hydrachnidae* and *Trombididae*.

The first division of the mites is formed of the *Water-acari*, with swimming feet, in two families: *River-acari*, *Hygrobatides*, and *Pond-acari*, *Hydrachnides*, the former having two, the latter four eyes. The *Hygrobatides* consist of the genera *Atax*, Dug.; *Nesaea*, K.; *Piona*, K., *Hygrobates*, *Hydrochoreutes*, K. (including the genus *Spio*); *Arrhenurus*, Dug.; *Attractides*, *Acercus* (formerly *Tiphys*, K.); *Diplodontus*, Dug.; *Marica*, K. The *Hydrachnides* consist of *Limnesia*, K.; *Hydrachna*, Müll.; *Hydryphantes*, K.; *Hydrodoma*, K.; *Eulais*, Latr.

As a second division, the author correctly separates the *Marsh-acari*, which, although living in the water, or at least in moist places, have no swimming feet, and therefore have not the power of swimming. These *Acari* have a long thick proboscis, narrowed by steps [stufenweise abgesetzten], seven-jointed legs, of which the two anterior pairs are separated from the two posterior pairs by a wide space. To this group belong the genera *Limnochares*, Latr., *Thyas*, K., both living in water, and creeping awkwardly under it; *Smaris*, Latr., and *Alycus*, K., both living on moist ground or under wet moss.

The *Land-acari* form the third division (as the author has afterwards corrected it; for, by mistake in the text, *Marsh-acari* is printed), having seven-jointed legs, without moveable bristles on them, and a little hook

on the point of the maxillary lobes; living on the ground. The first family, *Trombidides*, have free fusiform palpi, the penultimate joint of which resembles a claw, and the terminal joint is articulated at its base, as an immoveable appendage; the eyes are on a little projection at the sides of the proboscis: Confined to the genus *Trombidium*, F., composed of thirty-five species, among which *T. grandissimum*, from the Cape; *T. barbatum*, from Senegal; *T. flavipes*, from the south of France; *T. hirsutissimum*, from Greece, are described, and figured as new. The second family, *Rhyncolophides*, the author distinguishes, by the eyes being placed sideways on the back of the anterior part of the body: It contains the genera *Rhyncolophus*, Dug.; *Smaridia*, Dug.; *Erythræus*, Latr.; *Stigmaeus*, K.; *Caligonus*, K.; *Raphignathus*, Dug.; *Actineda*, K.; *Tetranychus*, Dug.

A fourth division, the *Running-acari*, is formed of such as have six-jointed legs, and a small pair of nippers at the point of the maxillary lobes. The only family, *Eupodides*, has two small, scarcely visible eyes, the fore and after parts of body distinctly separated from each other, free fusiform palpi, and a short proboscis, elongated fore-legs, serving for walking and feeling, and contains the genera *Bryobia*, *Scyphius*, *Pentaleus*, *Linopodes*, *Eupodes*, *Tydeus*, K., which prefer moist places.

Gervais has noticed various *Acari* (Ann. d. l. Soc. Ent. d. Fr. xi. p. 46): *Holothyrsus* is a new genus of the family of the *Oribatidæ*, with its body convex above, shield-shaped, flat beneath, margined laterally, the upper surface consisting of a single piece; no eyes, long four-jointed moveable palpi, legs long, and with claws: one species, *H. coccinella*, locality unknown. *Dermanyssus coriaceus*, living on the wings of the *Vespertilio noctula*; another *Dermanyssus* was found under the scales of *Coluber natrix*. *Ixodes Walkenæri*, from the rhinoceros; *I. Bibroni*, from a boa; *I. coxalis*, from a New Holland skink, are also named.

Gurlt has given an admirable representation of the *Acari* living as parasites on domestic animals. (Magaz. f. d. ges. Thierheilk, ix. Jahrg. 1. st. p. 18, t. 1.)

A discovery of Dr. G. Simon has attracted much attention, viz.,—that of an *Acarus* living in the human skin (Müll. Arch. f. Anat. u. Physiol. 1842, p. 218, t. 11). Henle has also found the same animal, and given an account of it in the Zürich "Öffentlichen Beobachter" (Dec. 1841). He, however, so far mistook the nature of the animal, as to consider it as an intestinal worm. At a later period (Bericht über die Verhandl. d. Naturf. Gesellsch. in Basel v. p. 191) Miescher also communicated his observations upon it, which confirm, in general, those of Simon, and in individual cases are more ample. Simon found *Acari* of $\frac{1}{10}$ ''' long, first in comedones, and soon after in healthy hair-sacs of the human skin; and it was soon evident, that they might be there without being prejudicial. Usually only one *Acarus* was found in a hair-sac, sometimes

two, rarely more; but in one dilated sac, containing many hairs, a company of thirteen individuals was discovered. The examinations were mostly confined to the skin of the nose (Simon), and the external organ of hearing (Henle, Miescher). Simon observed three different states of the animal, which in many points varies remarkably from other *Acari*, principally in the legs, which are short stumps like those of the *Tardigrades*, furnished at the end with claws. In the most frequent form the body is long and narrow, linear, the abdomen much elongated, and there are four pair of legs. The parts of the mouth are composed of a rather short, prominent proboscis, which is formed by an under-lip resembling a myrtle-leaf, and pointed mandibles lying upon it, and a pair of two-jointed palpi, the little knob-shaped terminal joint of which is moveable in all directions. In other forms the tarsi are the same; but the abdomen is remarkably shortened and conical. A third form has the long but still slenderer form of body of the first, but only three pairs of legs. This last I consider as the youngest condition, the second the more advanced. It does not appear to me probable, that the development is concluded in these three forms, and further observation is required. The internal structure is as yet unknown, as also the organs of propagation. So long as this is the case, it remains doubtful whether all these forms may not be young states of an *Acarus*, perhaps of a quite different shape, and found in other places. With this impression, Simon has not given it a generic name, but only marked it as *Acarus folliculorum*. Miescher was not satisfied with this name, and has called it *Macroaster platypus*.

Another *Acarus* has been found four times in comedones of the human skin, by Prof. Erdl, and is figured in Jul. Vogel *Icones Histologiæ Pathologiæ*, t. 21, f. 7. It is not accurately defined; but the figure points to a *Dermanyssus*, almost exactly agreeing with the *D. avium*, even to the longer proboscis, which considerably projects beyond the palpi.

For some time there was much noise in England about an experiment by Crosse, who obtained, by galvanism, a peculiar species of *Acarus*. The matter was brought before the Entomological Society of London last year. Newport made a communication from a Mr. Wheekes, who had obtained *Acari* in the same way as Crosse. Gray, on the other hand, stated, that Children has also instituted a series of experiments at the British Museum, precisely similar to those of Crosse, without obtaining a single *Acarus* (*Proc. Ent. Soc.* p. 55; *Ann. Nat. Hist.* x. p. 69). It was afterwards mentioned in the *Entomologist* (p. 307), that an Entomologist in Exeter (not named) had proved the *Acarus* of Crosse to be a well-known species widely distributed in houses, and added, that Crosse had a whole nest of them in his house, without being aware of it; and so it happened, that if one of them accidentally got into his apparatus, he believed that he had obtained it by his experiment.

PYCNOGONIDES.

THIS order has received an accession of new species from H. Goodsir (James. Edinb. New. Philosoph. Journ. xxxii. p. 136, t. 3): *Phoxichilidium globosum* (with globular swollen thighs), from Orkney; *Pallene circularis*, from the Frith of Forth; *Pepredo hirsuta*, from the German Ocean; *Nymphon Johnstonii* (ibid.); *N. pellucidum* and *N. minutum*, from the Frith of Forth; *N. spinosum*, locality not given. The new genus *Pepredo*, has, as characteristics: claw-shaped jaws; three-jointed palpi, of the length of the short cylindrical proboscis; six-jointed egg-bearing tarsi; the first tarsal joint small; no accessory claws; in general, it resembles *Phanodemus cost.* (S. Archiv. 1843, 1 Bd. p. 181), but differs in the form of body, which is narrow and contracted like *Nymphon*, while in the former the body is orbicular; so that the two genera cannot be united. *Pepredo* comes nearer *Nymphon*.

CRUSTACEA.

CANTOR has cursorily made known the *Crustacea* observed at Chusan (Ann. Nat. Hist. ix. p. 490). These are,—*Curcinus olivaceus*, new species (greenish-olive above; beneath white, with a single spine on the anterior part of the internal margin of the femur); *Sesarma tetragona*, new species (above green, beneath greenish-grey; arms and claws red); *Ses. quadrata*, Edw.; *Palæmon ornatus*, Ol.; *Squilla mantis*, F.; and an undefined *Limulus*.

D'ECAPODA.

RATHKE has made a contribution to the natural-history of the *Decapoda*, in the *Neuest Schr. der Naturf. Gesellsch. in Danzig*, 3 Bd. 4 Hft. p. 23, which finishes the notices, cursorily made already in vol. vi. of these Arch. 1 Bd. p. 241, on *Astacus marinus*, *Pagurus bernhardus*, *Galathea rugosa*, and *Hyas araneus*; and, at last, after repeated investigations into the development of the river cray-fish, he comprehends the history of the metamorphosis of the *Decapoda* under the following general points of view:—

1. Thomson's important discovery of the metamorphosis of the *Crustacea*, formerly doubted by the author, is completely confirmed.—2. Perhaps no *Decapod* comes from the egg complete in exterior form; even in the river cray-fish, in which the deviation is, smallest, the want of

the four latéral leaves of the caudal fan, and the proportionably shorter and thicker thoracic and thinner caudal parts, is to be remarked. In the lobster, the posterior feet are wanting, and the ambulatory feet have appendages for the purpose of swimming; the young of *Pagurus*, *Galathea*, *Crangon*, *Palaemon*, and *Ilyas*, have, when they leave the egg, neither abdominal members, posterior legs, nor gills; the proportions of the cephalothorax and abdomen are quite different; the former has often processes which afterwards become contracted.—3. The most essential difference of form between the young and adult is, that the thoracic portion of the anterior part of the abdomen, during growth, is retarded more or less in its development, and with it, also, that of the ambulatory legs and gills. These parts are farthest advanced in their development in the river cray-fish; whilst in *Pagurus*, *Galathea*, &c., they are altogether wanting.—4. The equalization of these differences occurs, in the lower grade, by alterations of the proportions (as is the case in the river cray-fish), in the higher, by the transformation of individual parts, as well as of the whole body.—5. The varieties of form between the young and adult individuals of the same species are greater, in an inverse ratio, to the degree of development in which the embryo leaves the egg.—6. The following are the causes of the metamorphosis of the *Decapoda*:—*a*. Portions of the body are afterwards formed: *b*. Those already present increase in size, without essential alteration of form: *c*. Or they, at the same time, alter in form: *d*. On the contrary, other parts are retarded in their growth: *e*. Others, again, are entirely cast off.—7. It is worthy of attention, that the river cray-fish, when it comes from the egg, can only creep, while the young of the sea *Decapoda* swim.—8. With regard to the limbs of the *Decapoda*, the rule in general seems to be, that they divide into two branches, and as development proceeds, each branch takes a different form and direction. (If we find in *Decapoda* and *Stomapoda*, the gill-bearing members simple, but those without gills cleft, the conclusion is, that the gills correspond to the second branch of the limbs. But, according to Rathke's observations on the lobster, the case is different; the gills are formed by themselves, and one branch of the ambulatory feet becomes wholly obliterated).—9. In some *Crustacea*, the cleft feet remain during life (*Mysis*).—10. However much the young lobsters resemble *Schizopoda*, particularly in their organs of motion, the development in these, in general, goes upon quite a different plan.—11. All the *Amphipoda*, without exception, appear very like their parents at the time they leave the egg; in other orders, particularly the *Decapoda* and *Isopoda*, great differences exist.

H. Goodsir (James. Edinb. New Philos. Journ. xxiii. p. 181) has confirmed, in opposition to Westwood, Thompson's discovery of a change of the *Decapoda*, in *Carcinus mœnas* and *Pagurus bernhardus*, without

his being acquainted with what had been done on this point by German Zoologists.

Kröyer has given, in his monograph on the northern species of *Hippolyte*, his observations on the development of *Hippolyte*, *Homarus*, and *Cymopolia*. The embryo of *Cymop. Caronii* is distinguished from the embryo of other *Brachyura*, as only the hindmost pair of the thoracic members project externally. (Dorsal and frontal spines first show themselves after the first exuviation.) The representation of the embryo of the lobster agrees essentially with that of Rathke. The young of *Hippolyte polaris* have very large sessile eyes, inclining towards each other; the antennæ placed under the eyes, the inner being three-jointed, the outer six-jointed, and with a two-jointed leaf-like appendage; the foot-jaws are cleft, the outer branch of the second and both branches of the third pair elongated; the ambulatory feet short and simple; the members of the swimming-tail consist of one common basal joint and two leaflets.

Joly (Institut. p. 239; Rev. Zool. p. 229) has observed the young of *Hippolyte Desmarestii*, which, as they come from the egg, have schizopodous feet, like those of *Mysis*; the front divided, a shovel-formed tail, no caudal members, three pair of thoracic feet, very large sessile eyes, unjointed antennal processes, and no gills. He could not completely distinguish the formation of the mouth in the little animal, at most 2''' long, yet he distinguished the mandibles, two pair of perfectly developed maxillæ, and a single pair of foot-jaws. The young of this species evidently show many deviations from that observed by Kröyer, yet, in other respects, the *H. Desmarestii* differs from the true *Hippolytes*. It is a fortunate circumstance, that observations on the development of the *Decapoda*, which is so various, are thus increasing.

The *Decapoda* of Ireland have been enumerated, and a list furnished, accompanied by valuable remarks on their distribution, by W. Thompson (Ann. Nat. Hist. x. p. 274). The part of this enumeration before me contains the *Brachyura*.

PARTHENOPII. — Milne Edwards and Lucas (Archiv. du Mus. d'Hist. Nat. ii. p. 479, t. 28) have made known two new species, one of which forms a new genus, called *Eurynolambrus*, because it unites the characteristics of *Eurynome* and *Lambrus*. The carapace is strongly dilated at the sides, covering the second and third pairs of feet; the basal joint of the external antennæ very large, anteriorly soldered to the front, the moveable portion inserted beside the groove of the internal antennæ: the species, *E. australis*, is from New Zealand. The other, *Cryptopodia angulosa*, native country unknown, is distinguished from the *Cr. fornicata*, by the crenated margins of the carapace.

GRAPSOIDEI. — One new species, *Grapsus strigilatus*, Adam White (Gray Zool. Misc. ii. p. 78), from New Zealand, is allied to *Gr. varius*.

HOMOLII.—Milne Edwards and Lucas (Archiv. du Mus. d'Hist. Nat. ii. p. 463, t. 24–27) have characterized a new species of the genus *Lithodes*: *L. brevipes*, from the South Sea, distinguished by the shortness of the rostrum and the legs.

HIPPIDES.—The same authors (ibid. p. 474, t. 28) have founded a new group, called *Albunhippa*, indicating its close alliance to *Albunea* as well as *Hippa*; the four antennæ are of equal length, the external thicker, the internal cleft at the point; the peduncle of the eyes slender, cylindrical; both anterior feet have double fingered claws: the native country of the *A. spinosa*, which was unknown to the authors, is the coast of Peru.

ASTACINI.—A new sub-genus, *Paranephrops*, has been formed by Adam White (Gray, Zool. Misc. ii. p. 79), from *P. planifrons*, a new species, found by Dieffenbach in the River Thames in New Zealand. The author places it between *Astacus* (*Potamobius*) and *Nephrops*; the eyes are large, as in *Nephrops*, the sides of the second section of the carapace have a spine, as in *Astacus* (but a long series of the species of *Astacus* have not this spine!); the rostrum has three teeth on the sides; the scale of the external antennæ projecting far over the thickened joints; the first two joints of the internal foot-jaws spinous on the outside; the middle leaf of the caudal fin of one piece; the first pair of feet more slender than in *Nephrops*, the claws only flatly channeled with few rows of spines; of the four other pairs of feet, the first is the shortest (in *Nephrops* the last), the second the longest, the last two of about the same length. Form that of *Astacus*.

CARIDES.—Krøyer (vide Sel. Naturv. og math Afh. ix. D.) has given a very exact account of the northern species of the genus *Hippolyte*. There are fourteen species described, grouped as follows:—*A.* The external foot-jaws with one palpus, but without the whip-like appendage. *a.* Legs also without it: *H. smaragdina*, new species from the coast of Norway.—*B.* Palpi and whip-like appendage to the external foot-jaw. *b.* Whip-like appendage to the first pair of feet: *H. Fabricii*, from Greenland. *c.* Whip-like appendage to the first two pairs of feet: *H. Gaimardii*, Edw.; *H. gibba*, new species from Spitzbergen; *H. mutila*, new species from the coast of Norway. *d.* Whip-like appendage to the first three pairs of feet: *H. Sowerbei*, Leach (*Cancer spinus*, Sow.); *H. macilentia*, new species from Greenland; *H. turgida*, new species from the coast of Spitzbergen, Greenland, and the north of Norway; *H. Phippsii*, new species, ibid.; *H. pusiola*, new species from Christiansund.—*C.* Whip-like appendage, but no palpus to the external foot-jaws. *e.* Whip-like appendage to the first two pairs of feet: *H. polaris*, Sab., very abundant on the coast of Greenland, also found at Spitzbergen and the coast of Norway; *H. borealis*, Owen, ibid. *f.* Appendage to the first three pairs of feet: *H. aculeata*, O. Fabr. (*Canc. grönlandicus*, J. Chr.

Fab.); *H. microceros*, new species from Greenland. The same author (Natur. Hist. Tidsskr. iv. p. 217) has illustrated the northern species of *Crangon*. He divides them into three genera: *Argis*, Kr., without rostrum, the eyes almost concealed, under the carapace, parallel, much longer than thick; branchiæ and second pair of feet as in *Crangon*; the legs of the fourth and fifth pairs dilated at the point; swimming feet: *Crangon lur*, Owen. *Crangon*, in its present limits, has a short rostrum, free diverging thick eyes, five pairs of branchiæ (no absorbed branchia on the foot-jaws of the second pair), the second pair of feet ending in claws, the legs of the fourth and fifth pairs pointed, ambulatory feet: *Cr. boreas*, Phipps; *Cr. nanus*, small new species found in the South Cattegat, and *Cr. vulgaris*, F. *Sabinea*, Owen, differing from *Crangon* by six pairs of branchiæ, and also by the branchial rudiment present on the fore-feet of the second pair, and by a very short second pair of feet without claws; with the species *S. 7-carinata*, Owen; *Crangon 7-carinata*, Sabine, Edw.

The genus *Cuma*, Milne Edw. (Ann. de. Sc. Nat. xiii. p. 292), and which was afterwards rejected by the same author (Hist. Nat. d. Crust. iii. p. 553), with the remark, that it is probably the larva of a *Decapod*, has been pointed out by Krøyer (Naturh. Tidsskr. iii. p. 503. t. 5, 6.—Isis, 1842. p. 915), who found eggs in a female, as a perfect form and an independent genus, which is increased with four new species, viz.,—*C. Edwardsii*, from the South of Greenland, apparently blind; *C. Rathkii*, *nasica* and *lucifera*, in the Cattegat. All these species have five segments of the anterior part of body, besides the cephalic portion, while Edward's *C. Audouinii* has only four.

STOMOPODA.

CARIDIODES.—H. Goodsir (James. Edinb. N. Phil. Journ. xxxiii. p. 174. t. 2.) has described a new genus and three new species of this family. The new genus, *Themisto*, has a near relation with *Mysis*, and is distinguished by the first, second, and fifth pairs of the caudal members being jointless and simple; those of the third and fourth pairs are more strongly developed; cleft feet. To this two of the new species belong: *Th. longispina* and *brevispina*; the third is *Cynthia Flemingii*: all three are from the Frith of Forth.

AMPHIPODA.

GAMMARINA.—This family has been enriched by Krøyer (Naturh. Tidsskr. iv. p. 141.) with a number of new northern genera and species. The new genera are,—*Opis*, agreeing with *Anonyx*, even to the very large

fore-feet: *O. Eschrichtii*, from Greenland, 4''' long. *Stegocephalus*; eyes apparently wanting, head very large, almost concealed by the large shield-formed epimera, which also covers the legs; upper antennæ, with a very small jointless whip-like appendage; the mandibles with very short jointless palpi; feet simple: *St. inflatus*, from Greenland, 1'' long. *Phoxus*; head very large, anteriorly produced and pointed; antennæ on its under side, the two pairs standing one behind the other; both have a thick pedicel; the mandibles have very long palpi; the two anterior feet formed for grasping: *Ph. Holbøllii* and *plumosus*. *Pontoporeia*; the first pair of feet with claws, the third pair grasping; the seventh with a shield-shaped dilated first joint; epimera large: *P. femorata*, from Greenland. *Pardalisca*; the fourth joint forming a hand on the first and second pairs of legs, the fifth and sixth a claw, yet so that the sixth joint is elliptical and spinous at the margin; epimera very small: *P. cuspidata*, from Greenland. *Promedeia*; the feet of the second pair small, no claw-like hand, but on the third and fourth pairs the two terminal joints unite into a long claw, which forms, with the third and fourth, a grasping hand; epimera short, the fourth, fifth, and sixth pairs of the abdominal members formed for leaping: *P. fasciata*, from Greenland. *Ampelisca*, like *Amphitoe*; the second pair of feet simple, the third and fourth pairs have a hand, the palm of which is formed from the third, the fingers from the fourth, fifth, and sixth joints: *A. Eschrichtii*, from Greenland. *Photis*; the first two pairs of feet have a claw-shaped hand, the fifth is curved backwards, standing reversed, with rudimentary claw-joint; the epimera very large: *Ph. Reinhardi*, from Greenland. *Ædiceros*; forehead elongated to a more or less pointed or blunt proboscis, which always swells into a transparent reddish yellow knob; eyes apparently wanting; the two anterior pairs of feet have a large claw-shaped hand, the seventh pair very long and thin: *Æ. saginatus*, not rare in the Greenland Seas, also on the north coast of Norway. *Lafystius*; head depressed, terminating in a proboscis; the two short, strong, fusiform pairs of antennæ, articulated, one behind the other, under the proboscis; the eyes on the upper surface of the head; the first pair of feet very slender, the hand linear, the second short and strong, with the hand quadrate, the rest strong-clawed; epimera of middling size: *L. sturionis*, in great numbers under the pectoral fins of the sturgeon, also on the *Squal. galeus*; the only parasitic *Amphipod* yet known.

The new species of the known genus are:—*Leucothoe clypeata*, from Greenland; *L. glacialis*, from Spitzbergen; *Gammorus dentatus*, from Greenland; *Acanthonotus inflatus*, from Spitzbergen and Greenland; *Ischyroceros anguipes* and *latipes*, from Greenland; *Podocerus Leachii*, living in a cuticular tube-like *Cerapus*. The author remarks, that with regard to the form of the second pair of feet, the female is a

Podocerus, the male an *Erichthonius*. This genus must therefore be abolished. In the genus *Anonyx*, Kr., he has remarked, that in the male, the antennæ are not only longer, but the inferior are even provided with a number of small cuticular appendages, which probably serve for laying hold of the female in copulation. To this may be added *A. appendiculosus*, of which *A. lagena* is the female. The same relation is found in the above-named genera, *Opis*, *Phoxis*, and *Ampelisca*, and is also present in the *Amphitoe*s; so *Amphitoe crenulata* and *inermis* are male and female of the same species, &c.

HYPERINA.—Guérin (Rev. Zool. p. 214, t. 1, f. 1.) has made known a new genus, *Cystisoma*, with two triple-jointed antennæ; the first two pairs of feet small, terminating in claws, the other legs long, narrow, and flat, the fifth pair longest; distinguished from *Daira* by the unequal legs; from *Themisto* by the want of the under antennæ; from *Primno* by the claws on the fore pair of feet. The species, *C. Neptunus*, of unusual size (3" 4"), comes from the Indian Ocean.

CAPRELLINA.—H. Goodsir (James. Edinb. N. Phil. Journ. xxxii. p. 183, t. 3) has described four species of *Caprella*, observed in the Frith of Forth. *C. spinosa*, of the author, is distinguished from *C. phasma*, by the position of the spines on the central rings of the body; *C. tuberculata*, is probably identical with Guérin's species of the same name; *C. lævis*, of the author, seems to agree with *C. linearis*, Hbt.; and *C. linearis*, of the author, must therefore be a new species. He appends some remarks also on their habits and internal structure. They live in deep water on coral reefs, are very deliberate and slow, sit upright as they fasten themselves by the hind legs, and bring small animals to their mouth with the antennæ. They often cast their skin. The alimentary canal is simple and straight, pulsating irregularly; the long narrow ovaries at each side of the alimentary canal are also subject to this pulsation. They are each composed of a single row of eggs.

ISOPODA.

ASELLOTA.—The genus *Tanais*, Edw., has been increased by Kröyer (Naturh. Tidsskr. iv. p. 167, t. 2) with a series of new species, viz.:—*T. Savignyi*, from Madeira; *T. Edwardsii*, ibid; *T. dubius*, from Bahia; *T. gracilis*, from Spitzbergen; *T. tomentosus*, from the Norwegian Sea; *T. Oerstedii* and *T. curculio*, from the Öresund.

MYRIAPODA.

"NOTES on Myriapoda" have been published by Walker (Entomol. p. 237, 293). They relate chiefly to the young state of several species,

without exactly defining the age of individuals in question; nor is the development followed out. Cantor (Ann. Nat. Hist. ix. p. 493) has enumerated the *Myriapoda*, collected by him at Chusan. There are three species: *Scolopendra morsitans*; and two new ones, *Polydesmus bicolor*, and *Scutigera rufipes*.

CHILOGNATHA.—A new genus, *Scolopendrella*, with one pair of ocelli, has been pointed out by Gervais (Ann. d. l. Soc. Ent. d. Fr. xi. p. 47): *Sc. notacantha*, inhabits the gardens of Paris.

CHILOPODA.—Newport (Procced. Zool. Soc. p. 177) has enriched the family of the *Geophilidæ* with some new genera.—1. *Mecistocephalus* is distinguished by the elongated head, and contains *M. ferrugineus*, Koch: *M. maxillaris*, Gerv.; and three new species: *M. punctifrons*, from India; *M. Guildingii*, from St. Vincent (West Indies); and *M. punctilabium*, habitat not known.—2. *Necrophlæophagus*, sub-genus of *Geophilus*, corresponding to the *Geoph. longicornes*, Gerv., contains the *G. longicornis*, Leach (*electricus*, Gerv.).—3. *Gonibregmatus*, with short transverse front; projecting, thick, folded lip, adapted for suction; long body, consisting of more than 160 rings, of which the two or three last are dilated and tuberos; small posterior graspers for creeping. The *G. Cumingii*, a new species, 5" long, is from the Philippines. The author supposes, that *Geophilus Walkenaeri* may belong also to this genus.

ENTOMOSTRACA.

PHYLLOPODA.

AN ample treatise on a new *Entomostrakon*, allied to the *Limnadia*, lately discovered at Toulouse, and called *Isaura cycladioides*, has been published by Joly (Ann. d. Sc. Nat. xvii. p. 293). Subsequently (ibid. p. 349) he has communicated some farther investigations on the allied animals hitherto known, from which it appears, that the genera *Isaura*, Joly, *Estheria*, Rüpp., and *Cyzicus*, Audouin, come together; and that *Isaura cycladioides*, Joly (= *Cyzic. Bravaisii*, Aud.), from France; *Limnadia tetracera*, Krynicki, from Russia; and *Estheria dahalacensis*, Rüpp., from Nubia; are three species of this genus, for which the author has retained his name *Isaura*. Audouin's name has remained unconfirmed, although it possesses the right of priority to the *Estheria* of Rüppell. The essential characteristics of the genus consist in this, that the very mollusk-like shell has projecting whorls, and that the pear-shaped process of the front in *Limnadia*, is wanting in this genus. The shell, as in many bivalve shells, has very distinct concentric striæ, but such, in fewer number, are also found in *Limnadia*, which in this respect, however, offers some variety. In *Isaura cycladioides*, the shell resembles much that of a *Cyzicus*; it consists of a number of

layers, united by animal matter, and laid above one another, but which can be separated by maceration in caustic alkali. The alimentary canal is simple, without cæcum; it also wants salivary glands and liver. The vascular system, in grown individuals, is not easily examined. The organs of respiration appear chiefly to be the membranous feet, which have a great similarity to those of the seventh or ninth pairs of *Apus*. The males are distinguished by a pair of peculiarly-formed grasping-feet, which are situated before the branchial members; besides these, no male organs could be found. The ovaries of the female resemble those of *Apus*; but no external passages could be found. The author considers, as the brain, a flattened part, situated under the eyes, which sends up a thin process towards them, while the optic nerves pass off from the posterior extremity. The oesophageal ring and ganglionic chain could not be perceived. The *Isaura* always swims with the back upwards, not by means of the branchial membranes, but only by their ramose rudder-like members, which the author calls antennæ. Conferences were found in the intestines as nourishment. Copulation takes place, as the author had abundant opportunity of observing, by the male grasping, with his claws, the under margin of the shell of the female, and penetrating, with the end of his body, between the two shells. How the seminal fluid arrives at the egg, the author has not observed. The fertility is very great. He counted, in one female, a thousand eggs. The development of the young agrees, in a great degree, with those of *Branchipus* and *Artemia*, as they come out of the egg. They have two pair of large rudder-shaped membranes, the second of which afterwards shrinks, as the branchial members develop themselves. At first neither blood nor circulation can be seen; after six days, globules of blood, and dorsal vessels, show themselves; and the beginning of the shell appears, like a horizontal membrane, upon the back. Two days afterwards, the shell becomes perpendicular, and encloses the little animal. The branchial members are then found so far developed, that the second pair of rudder-shaped members have disappeared; while, on the contrary, the first pair have attained a greater degree of development.

Waga (Ann. d. l. Soc. Ent. d. Fr. xi. p. 261, t. 11, f. 1-4) has made known a new species, *Branchipus torvicornis*, which is remarkable for the great hook-formed organs of the male, which are twisted, and send off several branches. He found it in the neighbourhood of Warsaw, in a deep dirty puddle.

SIPHONOSTOMA.

H. D. GOODSIR (James. Edin. New Philos. Journ. xxxiii. p. 178; Ann. d. Sc. Nat. xviii. p. 188) has given some observations on the development of

Caligus. The ovaries lie in the fore-part of the body, often even before the stomach; the eggs come out first into the inner, and then into the outer oviducts. The latter have a peculiar construction, which necessitates a gradual progression of the egg. It has, namely, transverse segments at regular distances, which must be broken through by the ripest egg, before it can force itself into the next empty cell. The larvæ are like those of *Cyclops* and *Lernæa*.

CIRRIPEDIA.

A notice, by Hinds, is to be found in the Ann. Nat. Hist. ix. p. 256, that he met with, at sea, in north latitude $36^{\circ} 9'$, west longitude 164° , *Anatifa* grouped together in bunches, without any marks of attachment to foreign substances. The water was likewise full of minute animals of the most lively motions. The *Anatifa* was present in astonishing numbers, and 332 English miles were travelled amongst them.

A notice of the presence of small fossil *Entomostraca* in Sussex, in limestone, has been given by John Philipps, in the Proceedings of the British Association, 1841, p. 64. They are small *Cyprides*, which are found in the inferior strata of limestone. *Isotelus megistos*, Locke (Sillim. Amer. Journ. xlii. p. 366, t. 3), is a large new *Trilobite*. It differs from *T. gigas*, by a bristle-formed process of the posterior corner of the shield.

REPORT

ON THE

CONTRIBUTIONS TO THE NATURAL HISTORY OF THE
ANNELIDES, DURING THE YEAR 1842.

BY

PROFESSOR C. TH. V. SIEBOLD OF ERLANGEN.

OERSTED has rendered much service to the correct knowledge of the *Annelides*, in having described the *Dorsibranchiata* of Greenland; and subjected the genus *Nais* to a more minuté revision, in regard to the speciés native in Denmark.

From his first treatise, "Udtog af en Beskrivelse af Gröenlands Anulata dorsibranchiata, Kröyer, Naturh. Tidsskr. B. 4, Hft. 2, 1842, p. 109," we learn, that O. Fabricius knew twenty-seven *Dorsibranchiata*; and Oersted having added sixteen new ones, forty-three are now known in Greenland. Of these, ten species are in common with Denmark, which possesses forty-two; and three with France, which has fifty-one species of these animals. In the enumeration of the species, Oersted has not only exactly discriminated them, and added their synonymes, but he has also given the characters of the genera.

Of the family of the *Aphroditeæ*, five species are enumerated: *Lepidonote scabra*, *cirrata*, and *punctata*; *Polynoe longa*; and *Pholoe minuta*.

Of *Amphinomeæ*, he mentions as new *Euphrosine borealis*, Oerst., corpore flavescente ovato-oblongo, segmentis 26-27, eminente capitis parte elongato-ovali, tentaculo uno semigloboso, branchiis 9-10 bi-tripartitis, cirro superiore nullo.

To the *Euniceæ* he adds the *Onuphis Eschrichtii*, Oerst.; corpore supra convexo, subtus plano, segmentis 50-60, stria transversa fusca

in quoque segmento, cirris postoccipitalibus longitudinem capitæ æquantibus, pinnis (ramis) in segmentis duobus primis exceptis, brevissimis, branchiis bipartitis basi pinnarum affixis.

Of *Nereides* nineteen species are enumerated. Oersted divides the genus *Nereis* into the sub-genera, *Nereis*, L., *Lycoris*, Sav., and *Heteronereis*, Oerst.; the latter principally characterized by its anteriorly twisted round, and posteriorly flattened body. To *Nereis pelagica*, and *diversicolor*; *Phyllodoce maculata*, *Syllis armillaris*, *Eulalia viridis*; *Eteone flava* and *longa*, and *Nephtys cava*, all of which Fabricius has mentioned, Oersted adds the following:—*Heteronereis paradoxa*, Oerst. (*Nereis longissima*, Johnston?); *Heteronereis assimilis*, Oerst. (*Nereis renalis*, Johnst.?); and *Heteronereis arctica*, Oerst., capite elongato conico 4-5 segmenta sequentia longitudine æquante, maxillis parum tortis crenulatis, parte antica corporis ex 20 segmentis constante lobis pinnarum partis anticæ omnibus abbreviatis rotundatis, cirro superiore quater vel quinquies longiore quam lobo primo; in parte postica lobo primo subacuminato, ceteris abbreviatis rotundatis, cirro superiore prominentiis 9-10 distinctis prædito.

Polyostichus is characterized as a new genus, with the following diagnosis:—Corpus lineare depressum ex duabus partibus, anteriore et posteriore forma inter se discrepantibus, constans. Caput appendicibus tentacularibus 11 instructum, palpi duo minuti, 4 tentacula, cirri tentaculares quinque. Os inferum absque maxillis. Oculi duo. In antica corporis parte pinnæ connatæ setis falcatis præditæ, in postica pinnæ discretæ, in superiore setæ compositæ falcatæ. Cirrus superior diversæ formæ in antica et postica corporis parte, cirrus inferior nullus. This genus is represented by *P. longisetosa*, Oerst. (*Nereis corniculata*, Müll.?)

Phyllodoce grænlandica is new; corpore viridi depresso, capite cordato paulo latiore quam longiore antice truncato, cirris tentacularibus in segmentis duobus anterioribus affixis, segmentis brevissimis, branchia superiore subrectangulari verticali, branchia inferiore subelliptica in mediis segmentis apice sursum versa, setis capillaribus 30-40. Another new species, *Phyllodoce incisa*, Oerst., may perhaps serve for founding a separate genus: corpore virescenti teretiusculo, capite conico duplo longiore quam latiore, cirris tentacularibus in segmentis duobus anterioribus affixis, segmentis mediis longitudine latitudinem corporis æquantibus subhexagonis, ceteris utramque extremitatem versus regulariter decrescentibus, branchia superiore subpentagona subhorizontali.

Eteone cylindrica is mentioned as new by Oersted, with the following diagnosis:—Corpore tereti, capite abbreviato conico, branchia superiore compressa subovali a pinna valde remota.

Nephtys longisetosa, Oersted, is also new; lamella superiore triangulari æque longa ac pinna, cirro superiore nullo, spatio inter pinnas

altitudinem pinnae inferioris subvincente, lamella inferiore horizontali brevior pinna apicem versus angustiore, setis capillaribus confertis pinnis ter longioribus.

Oersted considers the *Lumbricus capitatus* of Fabricius to be a *Glycera*; and he adds to this genus a *Glyc. setosa*,—segmentis pinnae gerentibus ex duobus minoribus compositis, pinnis et cirris et ligula branchiali destitutis quadrilobis elongatis (duplo longioribus quam altis) tribus lobis conicis obtusis, quarto multo brevior rotundato, mamilla parva in quoque latere segmentorum a pinnis valde remota, setis productis.

Of *Aricia*, Fabricius has only mentioned *Cirratulus borealis*, Lam. (*Lumbricus cirratus*, F.) To this Oersted adds *Ophelia bicornis*, Sav., *Scoloplos armiger*, Blainv., and the following new worms:—*Scoloplos minor*, Oerst.; capite globoso, in segmentis anterioribus utraque pinna papillis instructa, in posterioribus pinna superiore minutissimo rotundato, pinna inferiore multo majore acuminata, appendicibus caudalibus 4 filiformibus.—*Ophelia mamillata*, Oerst.; segmentis 25–28 singulo ex annulis 3 vix conspicuis composito, ligulis branchialibus in segmento 6to–14mo margine interiore duobus prominentiis praeditis, singulis segmentis posterioribus duobus paribus mamillarum lateralium instructis, papillis analibus 11 minutissimis omnibus ejusdem longitudinis et secundo quoque ejusdem latitudinis.—*Arenicola piscatorum* has also been mentioned by Oersted as a Greenland *Annelide*.

In a second treatise (Krøyer Tidsskr. ant. cit. p. 128, Conspectus generum specierumque Naidum ad Faunam Danicam pertinentium) Oersted reviews the Danish *Naides*, which he places in three divisions, according to the number of their bundles of bristles:—1. Segmenta omnia setis superioribus instructa. In this he places his new genus, LUMBRICONAIS, containing one species only, viz.,—*L. marina*, Oerst., which forms a connecting link between the small *Lumbricinae* and the *Naides*.—2. Segmenta quatuor anteriora (interdum sola duo) setis superioribus destituta. In this Oersted arranges *Proto digitata*, Ok.; *Stylaria paludosa*, Lam. (*Nais. proboscidea*, Müll.); and the new genus, SERPENTINA, Oerst., with the under lip drawn forwards, containing the single species *S. quadristriata*, Oerst. (*Nais. serpentina*, Müll.) The genus *Nais* approximates this, without any projections. To it belong the *N. elinguis*, Müll., and *N. barbata*, Müll., and two new ones, viz.:—*N. uncinata*, Oerst.; corpore ex 20–25 segmentis constante pellucido, setis sub-quaternis et superioribus et inferioribus uncinatis ejusdem formae in omnibus segmentis: and *N. littoralis*, Oerst.; corpore ex 20 segmentis constante pellucido, segmentis mediis duplo longioribus quam latis, posticis brevissimis, setis omnibus uncinatis in antico pare pinnarum 7–8 valde porrectis, in ceteris 3–4 prominulis.—3. The third division of the *Naides* possesses *Chaetogaster*;

segmenta omnia pinnis superioribus destituta: and *Aeolosoma*; setis capillaribus praedita. Under the *Chatogaster* Oersted arranges *Nais diaphana*, Gruith.; and in *Aeolosoma* the *A. Ehrenbergii*, Oerst., which may be *Aeol. decorum*, Ehrb. et *Aeol. Hemprichii*, Ehrb.?

Rathke (Neueste Schr. der naturf. Ges. in Danzig. B. iii. Heft 4, 1842, p. 56) has published a very minute description of the *Amphitrite auricoma*, with beautiful plates.

Rathke observed this worm alive on the Norwegian coast. The mouth is without jaws, and beset on both sides with a tuft of fifteen tentacles, capable of being much elongated and shortened, and two red blood-vessels shine through them. These tentacles secrete a glutinous slime, and are covered on their upper surface with very vibratile cilia. Close upon the notched fold of skin which envelopes the tuft of tentacles, there is found on the vertex, on each side, a transverse row of thick golden yellow bristles, which are put in motion by several bundles of muscles. The margin between the occiput and upper side of the head, is edged by an indented fold of skin, which runs out anteriorly to a pretty long and thick cirrus; the post-occipital segment has, on each side, a somewhat smaller cirrus, and the second and third rings of the body have a golden yellow branchia, the leaves of which glitter strongly. On the inner side of the tuft of bristles, and the leaf-like projections found upon them, is remarked, on each of the other segments of the body, a round and rough protuberance; four such protuberances are situated on the mesial line, on the abdominal side of the first four body rings; these rough portions of skin probably serve for defending the animal, when it slips out of the tube in which it is concealed. The anal part of the body consists of two halves, of which the one resembles a heart, furnished with indented lateral margins, while the other smaller half represents a moderately thick oval leaf. The anus is placed where those two parts join together.

From the contents of the alimentary canal, Rathke concludes, that this animal is nourished only by the slime of the sea. As neither eggs nor seminal fluid were found in the cavity of the body, it is probable, that it possesses separated sexual organs. How the eggs and seminal mass get out of the body, is not clear, and Rathke supposes, that for this purpose, openings are placed on the sides of the body, near the different bundles of bristles. A quadri-partite glandular mass, situated on the first and second rings of the body, on the abdominal side, with an opening externally in the first ring, probably serves for the secretion of a cement, which the worm uses in making its arenaceous tube.

We have also, by the same author (op. cit. p. 84), the description of the hitherto little known *Siphonostoma plumosum* (*Amphitrite*

plumosa, Müll.), which Rathke observed in the slimy bottom of the sea on the Norwegian coast. It has sixty-four rings, each of which has two pair of bundles of bristles; the bristles are simple, longitudinally striated on the upper surface, and furnished on the inner with moderately thick transverse septa. The whole upper surface of the body is rough, with small close set warts, which secrete slime; the epidermis has an olive green, and the corium a slight rosy hue. The four cornered opening of the mouth is situated at the anterior end of the body, in a short, almost infundibuli-form proboscis; close upon this are found two whitish contractile tentacles, which are provided with a longitudinal furrow; behind these tentacles there are eight cirri, twisted, round, and of a greenish colour; they stand in two rows behind one another. The animal can draw all these parts completely within the body; when stretched out, they lie protected under the long bundles of bristles of the first two rings. The contents of the intestinal canal appeared to be an animal pap, mixed with earth and sand. The blood of this worm is intensely green. Rathke also corrects Otto's description of *Siphonostoma diplochaitos*, in so far as to have shown, that the double mouth, which Otto ascribed to this animal, is only the effect of the too close approximation of the opposite lateral margins of the otherways simple mouth. Costa has also corrected this error (Archiv. 1842, B. ii. p. 322).

Milne Edwards (Ann. des Sc. Nat. tom. xviii. 1842, p. 126) has given an account of the internal structure of the anomalous *Peripatus juliformis*, from which it appears, that this creature is not a *Myriapod*, but should be correctly enrolled among the *Annelides*.

We learn, from a minute anatomical investigation which Krohn has made of *Sternaspis thalassemoïdes* (Müll. Arch. f. Physiol. 1842, p. 426) that Otto had looked at this worm in the reversed position, and has described the posterior parts as the anterior. Its proboscis, according to Krohn's account, is an anal tube; and the vesicula analis, mentioned by Otto, points out, externally, the position of the brain at the anterior end of the body. The little tufts, situated under the two oval marks (verrucae frontales, Otto), close above the anal tube, Krohn has recognised as blood-vessels. The sexual organs lie in the posterior cavity of the body, and contain, in the male individuals, seminal threads, and in the female, distinct eggs.

Leuckart (Zoolog. Bruchstücke, ii. 1841, p. 104) has described an interesting Annelide, *Geoscolex maximus*, which was found in loam in Brazil, not far from Rio Janeiro. Its length was three feet three inches; but when in life it must have been eight or nine feet. Preserved in spirits of wine, it has now a blackish-brown colour. It belongs to the setigerous *Annelides*, and stands very near *Lumbricus*. Leuckart has characterized the genus under the name of *GEOSCOLEX*, as follows:—
Corpore lumbriciformi, ore bilabiato, labiis latis, ab annuli primi mar-

gine anteriore sejunctis, internis (protractilibus?); clitello in anteriore corporis parte posito, parum ab orificio oris remoto; setis in singulo corporis annulo (clitelli annulis exceptis, setis 4 tantum instructis) octo inferioribus, in annulis anterioribus per varia approximatis, in iis partibus corporis posterioris sensim inter se magis remotis. Species: *G. maximus*; corpore annulis plusquam 400 instructo, colore nigricante? Leuckart distinguished in this worm an anterior portion, a clitellus, and a trunk. The anterior portion is thickest, and consists of fourteen rings. The clitellus is formed of nine rings, and leaves free, as it does not quite surround the body, a furrow of 3-4" upon the under surface. The last ring of the extraordinarily long trunk is rounded obtusely; but whether the opening found in it be actually the anus, is a matter of doubt, since a piece of the body might easily have been torn off. The first three small rings, of the anterior part of the body, are ribbed longitudinally; between the fourth and fifth rings of the clitellus, on the under side, near the thickened margin of the clitellus, Leuckart discovered a small round elevation, in the middle of which was a small hole, evidently the sexual opening. On the anterior margin of most of the body rings, except the first thirteen of the anterior portion, and some rings of the clitellus, there are two small openings on the under side, which he supposes to be branchial apertures.

Hoffmeister has written a very excellent dissertation on *Lumbricinae*; "De vermibus quibusdam ad genus Lumbricorum pertinentibus." Bero-
lini, 1842. To avoid repetition, it will be discussed with another treatise, by the same author, on land *Annelides*, in next year's report.

Stein has published a short description of the sexual parts of the (regenwurm) grub (Müll. Arch. 1842, p. 270).

Loven has given an interesting contribution to the, as yet, wholly unknown history of the development of the *Annelides* (Archiv. 1842, th. 1, p. 302, and Ann. des Sc. Nat. t. xviii. 1842, p. 288). He caught in the sea, small creatures, in the form of an oval disc, and a hemisphere arose from the disc. The disc was beset, at the margin, with a double row of vibratile cilia. On the upper side, near the margin, a mouth was distinguishable, set with cilia; and on the top of the hemisphere was an opening, apparently the anus. Upon the under, slightly arched side of the disc, was observable an opaque spot, with two small points. The hemisphere became gradually elongated, divided into transverse rings, and the spot, above mentioned, became gradually more opaque, and acquired two filiform appendages;—in short, the creature changed into a *Nereid*; but its last metamorphosis, unfortunately, could not be watched to the end.

De Filippi has published his researches on the genus *Clepsine*, "Lettere del Dott. F. de Filippi sopra l'Anatomia e lo Sviluppo delle Clepsine. Pavia, 1839." He has here more exactly characterized a species,

formerly given by him as new, *Clepsine sanguinea*. Its intestines possess nine red lateral close sacs, which are forked at their closed end; and its two eyes form oblong somewhat irregular spots. The species has some resemblance to *Clepsine paludosa*, but is not so pointed anteriorly, and especially, is not so soft as it. It also differs, by its bluish green colour, from the dark green *Clepsine*. It has the habits of *Clepsine complanata*, and readily attaches itself to stones and mussels. Of the internal structure of the *Clepsine*, which is fully described, we may notice particularly, that De Filippi recognised a direct connection between the digestive canal and the system of blood vessels, by which the blood sucked by the leech from the mollusca, after a short stay in the intestines, passed immediately into the blood-vessels; and these animals thus gained their supply of blood by transfusion. The same peculiarity also exists in *Hæmocharis*; but not in *Sanguisuga*, *Hæmopsis*, nor in *Nephelis*, which gorge whole animals as well as blood.

Wahlberg has described a new leech, which, in Sweden, supplies the place of the medicinal one (Froriep's Neue Notizen, Bd. 23, p. 296). The ground colour of its strong warty skin is black brown, with six broad coal-black dorsal stripes, and small white points standing round the body, on each fifth segment. Its egg capsule is formed like that of the medicinal leech. Some observations are given upon this by Wedeke (Fror. Neue Notiz. Bd. 21, p. 183). The leeches, when they wish to lay their eggs, leave the water, and creep many yards away, to seek a comfortable bed under moist loose earth. Here they emit, from their swollen maw, a slimy green coherent fluid, through which they trail the body as far as the sexual aperture. They lay their eggs in this viscous matter, and glue, with the saliva flowing from their mouth, a paste round about the egg capsule, which hardens and forms the well-known spongy covering. When this is done, each leech draws itself backwards out of the egg capsule, and twists its two sexual apertures together.

The copulation of *Hirudo piscium* has been observed by Brightwell (Ann. Nat. Hist. ix. p. 11, and Fror. Neue Notiz. Bd. 22, p. 65). According to him, a white substance was perceived in the neighbourhood of the sexual openings; the eggs, which these leeches attached to the sides of a glass vessel, were very small, oblong oval, hard, of a reddish-brown colour, having longitudinal elevated ridges on the sides. In each egg, which was covered with a white filmy web-like secretion, was produced one young one, with four eyes, on the thirtieth day. This was ascertained by detaching an egg, and keeping it in a glass by itself. Besides this leech, Brightwell observed, in the fresh-waters of England, the following:—*Hæmopsis sanguisorba*, Sav.; *Sanguisuga medicinalis*, Sav.; *Nephelis vulgaris*, Sav.; *Nephelis tessellata*, Blainv., the abdomen of which was covered with young to the number of 143; *Clepsine complanata* and *hyalina*.

The following Irish *Annélides* have been enumerated by Thompson (Ann. Nat. Hist. vii. p. 482):—*Nemertes gracilis*, Johnst.; *Nem. lactiflorea*, Johnst.; *Phylline hippoglossi*, Lam. (*Hirudo hippoglossi*, Müll.); *Carinella trilineata*, Johnst. (*Gordius agnolatus*, Mont.); *Glossipora tuberculata*, Johnst.

Rathke has added a new species to the very little known family of *Nemertinae*, which he has named *Borlasia striata* (Neuest. Danz. Schrif. p. 93). It was discovered on the coast of Norway. It is about the thickness of a crow-quill, and a foot in length; the body is almost round, narrowed posteriorly, and marked with black stripes, alternating with twelve clearer ones. At the anterior margin of the body a small opening was found, which Rathke did not regard as the mouth, which lies farther down on the abdominal side, and represents a large longitudinal cleft. On the right and left of the anterior end of the body is a boat-shaped, superficial, longitudinal furrow, to which a strong bundle of nervous fibres passes from the red ganglion of the brain, on which account Rathke is inclined to think these furrows are the seat of more acute sensation. Before them, eight or nine very small black ocellated points are observable. The slimy thickish cuticular covering has a number of slight segmental furrows. The intestine, running out straight at the posterior end of the body, contained a whitish slimy fluid, from which Rathke conjectures, that this worm sucks its nourishment from other white-blooded animals. As a great number of small, thin, cuticular sacs, which were attached in a single row, behind each other, on the inner wall of the body of this worm, contained in some individuals distinct eggs, and in others a fine granular substance (semen), Rathke assumed, that it possessed separated sexes; but he could not discover sexual openings in these sacs. Under the dorsum runs a very long snow-white and spiral canal, which is very muscular, and can be bulged out, like a proboscis, at the opening first mentioned. He could not make out its use. It does not belong to the sexual parts, as very young specimens, which had neither sexual bladders nor testes, yet possessed this organ. The abdominal nerve of this worm is composed of two white cords, which, arising from the ganglion of the brain, run down on the lateral margin of the body, far separate from each other, without forming ganglions. Other Naturalists do not agree with this view of the organs. Dr. G. Johnston takes the two nervous cords for blood-vessels, and the cerebral ganglion for a heart. Ehrenberg holds the alimentary canal to be an egg passage, and the white spiral organ is, he thinks, the intestinal canal; while Huschke takes the latter for a seminal vessel, and the bulged-out proboscis for the penis. The researches of Quatrefages (l'Institut. p. 427, 1841) agree better with those of Rathke. He describes the nervous system of *Nemertes* as two long threads, running down on both sides of the body, which arise from two

ganglions, united by a cross band; four threads go to the anterior parts from these ganglions, two of which can be traced into the large eyes. Dujardin also has found a similar organization in another species of *Nemertes*.

Leuckart has given a copious account of the remarkable genus, *Myzostomum*, which lives as a parasite upon the *Comatula*, and forms a link between the *Annelides* and *Trematoda* (Zool. Bruchst. iii. 1842; Helminthologische Beitr. p. 5).

He characterizes this genus, founded by himself, as follows:—Corpore molli, clypeiformi; supra-depresso vel convexo, infra organis suctoriis et motoriis, tam acetabulis (s. bothriis) quam hamulis corneis 10, instructo; ore antico, simplice, prominente (tubuloso?) retractili. As Leuckart only examined specimens preserved in spirits of wine, many parts of the structure have remained concealed from him, so that his views of these parasites may be incorrect. The examination which Lovén has made of living individuals (Arch. 1842, B. i. p. 306, and Ann. d. Sc. Nat. t. xviii. p. 291, and Amtlich. Ber. über die 19te Versamml. deutscher Naturforsch. Braunsch. 1842, p. 82) gives us a very good idea of the structure of *Myzostomum*, and puts us in a condition to conjecture the real use of the shrivelled-up parts seen by Leuckart. *Myzostomum cirriferum*, Leuck., is furnished with the following diagnosis:—Corpore orbiculari, margine cirrato; acetabulis in utroque latere 5, hamulum simplicem emittentibus; hab. in mari septentrionali, *Comatulæ europææ* parasitus. Lovén has frequently found this species on *Comatula europæa* on the west coast of Denmark. The whole surface of the body, the margin of which is covered by twenty cirri, shows vibratile motions. On the middle of the dorsum are two slight elevations. On the abdominal surface is found, anteriorly, the fleshy proboscis, which can be completely drawn in; on the sides there are five pairs of stumps of tarsi, and between these, four pairs of acetabula; on the margin of the orbicular body, on each side, are the two male sexual openings, and the simple vulva, together with the anus. Of the internal organs, Lovén has described the nervous system, the intestinal canal with its appendages, the male and female organs of generation. Of the latter, the ovarium, with its ramifications, occupies the whole disc, and contains spherical eggs. Lovén concludes, from the lively motions with which the hermaphrodite of this hermaphrodite animal swim about in the water, that its eggs become impregnated by the spermatozoa after they are laid; with which supposition the reporter is inclined to agree, as the spermatozoa of these hermaphrodite water-animals stiffen in the water. The reporter cannot help remarking, that it would have been most desirable, had Lovén described somewhat more exactly, the ovary, and the different steps of development of the eggs of this animal, for the organ described by him as an ovarium, evidently resembles that organ of

excretion, which, in many *Trematoda*, discharges itself at the posterior end of the body, and which also pushes out its contents backwards,—an action often mistaken for the laying of eggs. Each stump of a foot consists of three parts, the last of which is furnished with four retractile horn-like hooks. By these feet, this parasite reminds us of the lower *Crustacea*, but it cannot perhaps be united to them, because the vibratile organs, which cover the superior surface of *Myzostomum* are altogether foreign to the *Crustacea*, insects, and *Arachnida*.—Leuckart describes another species, under the name of *Myz. costatum*: Corpore depresso, ovali margine crenulata, dorso costato; acetabulis suctoriis hamuliferis separatis, acetabulis utrinque 4 et hamulis in utroque latere 5; hab. in mari rubro, Comatulæ multiradiatæ parasitus.—A third species, *Myz. glabrum*, has the following diagnosis:—Corpore orbiculari, dorso convexo et marginibus glabris, infra concavo; acetabulis in utroque latere 5, hamulum simplicem emittentibus; hab. in mari Mediterraneo, Comatulæ mediterraneæ (europææ) parasitus. This species varies from *Myz. cirriferum* almost only by the absence of cirri; and Leuckart himself has some doubt of these two species being distinct, since it is improbable, that two quite different species of a parasitic genus, should live upon one and the same animal in different seas. He also hazards a conjecture, whether the presence of cirri may not perhaps point only to a youthful condition. The reporter is convinced, that *Myz. glabrum* and *cirriferum* belong to one species, and that the former is an individual in which the cirri have shrunk, or become otherways lost. He infers this, from a specimen which he has taken from a *Comatula europæa* at Cattaro, in which, besides the five pairs of stumps of feet, he distinctly recognised four pairs of acetabula, which Lovén likewise saw, and Leuckart had probably overlooked; and the margin of the disc of which he found covered with twenty very small projections, which the reporter supposes may be the shrunk or cast off cirri.

A work of Duvernoy, which, according to its title (*Considérations sur les Animaux Articulés, sur les limites de ce type, et sur la place qu'il doit occuper dans les cadres de la méthode naturelle*. Paris, 1841), should contain only general remarks on the *Annélides*, has not yet come to hand.

R E P O R T
ON THE
CONTRIBUTIONS TO HELMINTHOLOGY,
DURING THE YEAR 1842.

BY
PROFESSOR C. TH. V. SIEBOLD OF ERLANGEN.

AN Essay has been published by Steenstrup, "Über den Generationswechsel oder die fortpflanzung und Entwicklung durch abwechselnde Generationen, eine eigenthümliche Form der Brutpflege in den niederen Thierklassen, Copenhagen, 1842," which will create an epoch in *Helminthology*, and be read by every Naturalist with the greatest interest. He has arranged, and attempted to point out, a series of remarkable phenomena, which have been discovered in the propagation of certain lower animals, but which could not hitherto be explained, and have therefore stood quite isolated; that one and the same original idea is found expressed in them, which he designates by the name of (*Generationswechsel*) transmutable generation. This original idea of nature is, that an animal bears a brood, which is neither like the mother-animal nor becomes so; but this unlike-one itself brings forth a brood, which, in form and all other relations, returns to the mother-animal; so that it again finds its like, not in its own brood, but in its successor of the second or third link, &c. In the orbicular *Medusæ* and bulbous *Polypi*, Steenstrup has satisfactorily followed out this generation through its different links. Among the *Helminthes*, the *Trematoda* are particularly subject to such a change, and traces of it are found in various other orders of these animals. The reporter must completely assent to the intelligent view which Steenstrup takes of the remarkable

metamorphosis, to which the larvæ of *Trematoda*, hitherto known as *Cercariae*, are subject; but he cannot agree with him in assuming, that the generation of the *Cercariae* is now completely understood; for here, as will be afterwards pointed out, there are considerable gaps to be filled up. In no single species of *Trematoda* is this change completely known: here or there several links are wanting in the chain of the metamorphosis, which must be supplied by direct observation, before we can look upon the cycle of the different links of any one of them as concluded. The reporter has no doubt, but that these gaps will be filled up, especially as Steenstrup's excellent idea points out a way to that object. In following it in order to develop these wonderful metamorphoses of the *Helminthes*, we must not allow conjecture to slide into the series, and imperceptibly assume the place of approved fact.

The early and much misunderstood theory of equivocal generation, particularly as regards the engendering of intestinal worms, is now beginning to lose its weight with English Physicians. Dr. Watson is inclined to the opinion, that the *Helminthes* are introduced, as germs or eggs, within the human body (London Med. Gaz., May, 1842, part 2. vol. ii. p. 231); and he questions, whether some of the *Entozoa* may not be originally *Ectozoa*. Against the doctrine of equivocal generation he relates the following circumstance, told him by Abernethy:—A healthy flock of sheep were driven through a considerable tract of country, and one of them on the way broke its leg, and had to be carried on horseback. For one night the flock, with the exception of the maimed one, rested in a marshy meadow, and every individual was seized with the rot but itself; it escaped the disease, and had no liver-fluke. Watson asks, whether it may not be assumed, that the flock swallowed the eggs of the fluke with the fodder they cropt from the moist meadow. The eggs might then, as is the case, especially with *Helminthes*, shut up in cavities, be conveyed by the blood to the liver. The reporter has often heard this opinion expressed by Physicians and Naturalists; but he cannot conceive how the eggs of *Helminthes*, remaining passive in the intestinal canal of an animal, should get into the vascular system, which is everywhere shut up from it. However, he is also perfectly convinced, that many *Helminthes*, after throwing off the egg-covering, can pass, in their embryo state, through the parenchyma, to the organ suitable to them. Hammerschmid made a valuable observation on the origin of *Helminthes*, at the fourth meeting of Italian Literati at Padua (Berliner Vossische Zeitung, 14th Oct. 1842), viz.,—that *Tenebrio molitor* is afflicted with intestinal worms when it feeds on flesh, and is free from them when it consumes meal.

A remark of Dr. Wolfring may be mentioned, on the geographical distribution of the *Helminthes* (Medic. Corresp. Blatt bayerisch. Ärzte, 1842, p. 805). He described the district of Thalmessingen as a valley

through which the Thallack flows, and surrounded by two rows of lofty calcareous hills, that furnish a very hard water, containing many earthy ingredients. The soil is very damp; and most of the buildings stand upon wet foundations, so that cellars are rarely to be met with. The food of the inhabitants is mostly meal, salted and smoked beef, and much pork. The disease of worms is here very common, and has been so from a very remote period. *Tenia solium* and *Ascaris lumbricoides* are particularly abundant. Now, a league beyond this district, the disease is very rare.

GORDIACEA.

An Essay by Berthold, published some years since, has again appeared last year, with additions, "Über den Bau des Wasserkalbes (*Gordius aquaticus*), Götting. 1842," and deserves our attention so much the more, as, till very lately, our knowledge of this animal has been very defective. When the reporter places the *Gordiucea* as a separate order of *Helminthes*, he has convinced himself, in the most precise manner, by direct observation, of the entozootic life, which, at certain times, the *Gordius aquaticus* leads; but he could not resolve to incorporate it with the *Nematoidea*, since it differs remarkably in its anatomical structure.

Berthold found the *Gordius aquaticus* generally in brooks and small springs about Göttingen. Its colour is sometimes a bright, sometimes a more sombre brown. The head-end forms a white, semi-transparent arch behind, which the dark hue makes a sort of ring, from which two dusky-coloured stripes run longitudinally down the whole body; the posterior end of the body presents a horizontally lying fork, at the under angle of which the anus opens. The reporter must here correct Berthold's assertion, that this fork is only present in male individuals; for, according to his experience, there are not so many male *Gordii* to be met with as females, which possess a rounded anal extremity. The anal opening (which the reporter besides considers as the sexual opening) is found in the female, in the centre of the obtuse end of the tail. Berthold describes the cuticle of the *Gordius* as composed of two layers, the outer consisting of a reticulated tissue, the meshes being bounded by six unequal sides, and pores are present where the mesh-threads meet at the different angles. This membrane, according to Berthold, is very vascular; but the reporter could neither discover the vessels, nor the pores mentioned by him. He recognised in it only an epidermis, composed of an angularly-netted epithelium, the cells of which were arched somewhat outwardly; and probably Berthold took the calibre

of them for pores. The second cuticular layer, which Berthold describes and figures as a tissue of meshes, composed of oblong nooses, the reporter could not find; but, on the contrary, he saw a fibrous tissue lying under the epidermis, and connecting it with the muscular layer, and which might be compared with the corium. It consists of elastic yellow threads, crossing each other obliquely from right to left. These threads lie crowded together in quantity without number: each individual thread seems to run along the whole body of the worm without interruption, winding spirally either to right or left. If the cuticular layer be separated from the muscular beneath it, many threads of that described as the fibrous remain on the muscular layer, while more or less stick to the epidermis, and on its inner surface make a net-work of greater and smaller lozenges; they also give a fibrous appearance to the torn or cut margins of the cuticular and muscular layers. Berthold has certainly seen these threads; for, in describing the cuticular system of the *Gordius*, he here and there mentions fine threads, tender little fibres, &c. He describes the organs of motion, quite correctly, as a tolerably thick muscular layer lying under the cuticle, and inclosing the intestines like a tube: it is composed of longitudinal fibres. He could not precisely determine whether these stretch along the whole body of the worm, or are only short, and lie with their beginnings and ends behind and near each other, but conjectures the latter. The reporter is of the same opinion, since this muscular layer, when torn across, presents a net of longitudinal meshes. The individual colourless unstriated muscular fibres, according to the reporter's observation, resemble very thin ribbon-shaped stripes, which lie with their surfaces close to each other, and so form the muscular covering which glitters like satin. The reporter could not perceive the transverse fibres which should cover the longitudinal muscles externally; but he has quite convinced himself, as well as Berthold has done, that the *Gordius aquaticus*, in its motions, keeps constantly one and the same length and thickness. With regard to the other organs of this animal, the results which the reporter drew from his investigations, differ so much from those of Berthold, that he will first premise these researches, in order afterwards to compare them with his own. Berthold believes that he has discovered the nervous system of the *Gordius*, to be two slender threads, not properly confined, running parallel beside each other under the intestinal canal. The dark longitudinal bands which run down the body, point out the position of the longitudinal vessels situated under the skin, one of which runs as an artery in the brown dorsal stripes, and two as veins beside each other in the abdominal stripe. With these vessels the above mentioned cuticulo-vascular net coheres; and this, according to Berthold, is for the process of respiration. He had not seen traces of actual circulation of blood in this vascular system. The mouth of the animal is placed, eccentrically,

in the white semi-transparent arch. The intestine is a very thin simple canal, which runs on the abdominal side of the walls of the body, and ends in a very short cloaca, common to it and the female sexual openings. A thin vessel winds along with this intestine, which, arrived beneath, discharges itself into the common canal of the two female sexual organs, and is looked upon by Berthold as a testis. External organs of copulation are wanting. Berthold describes, as the female sexual organs, two wide tubes running along the whole body, filling up for the most part its walls, which commence above and near the beginning of the alimentary canal, and internally are united to each other. About one-fourth inch from the anus, they join into a common canal, forming a cloaca with the end of the intestine. These ovarian tubes are only loosely united to the neighbouring wall of the body, and have a very regular articulated appearance, like the body of a tape-worm. The walls are composed of two cuticles, the exterior (the firmer) forming the tape-worm-like rings, while the interior seems very loose, and presents a tissue of meshes like a spider's web, with very fine egg cells. These meshes must be vessels. Berthold has observed numerous little balls come out from the anus, which are composed each of an immense number of eggs. In the early part of spring the *Gordii* contain no eggs, but a scanty milky fluid, composed of very small granules.

Such is Berthold's account. With regard to the nervous system, the reporter has had as little success as he had. His longitudinal vessels were not to be found; and the cuticulo-vascular net, described in conjunction with them, is probably nothing else but the fibrous tissue lying under the epidermis. The two tubes, running within the cavity of the body, on the abdominal side, the reporter has never missed either in male or female individuals: that lying next the abdominal wall was always much stronger than the other. Both had fleshy walls, and contained a clear fluid, mixed here and there with small grains. The reporter could not discover, either the superior origin, or the under end of the two simple thick-walled tubes: That one of these may be an intestinal canal is probable; but the reporter cannot find a single proof that the other is a testis. The greatest part of the cavity of the body is filled up by a peculiar cellular tissue, which leaves free a channel-formed space on the abdominal side, within which the two simple tubes just mentioned run; besides, two hollow cavities stretch through the cellular tissue longitudinally, until they approach the posterior end of the body, where both unite into one, and discharge themselves at the opening of the after part of the body. The reporter questions, whether the cellular tissue forms the two thick-walled tubes lying close beside each other in the mesial line, and passing into a common tube posteriorly. According to Berthold's description of the female sexual organs, such might actually be the case, for the double egg-tubes mentioned by him, are evidently

the cellular tissue recognised by the reporter. We may thus consider this cellular parenchyma, as two tubes glued close together. They are in the male individual the testes, in the female the ovarian tubes. The construction of the walls agrees generally in both sexes; but still there is a certain specific difference. The walls of the testicular tubes are entirely colourless, and consist of a double layer of cells, lying close upon each other, which Berthold held to be egg-cells. Each cell has a distinct round kernel. The form of the individual cells is always oblong, with rounded corners. Its thickness is only half its breadth. Sometimes they contain a greater or lesser quantity of a very fine-grained mass. The cellular walls of these tubes have an extraordinary resemblance to the parenchyma of a plant. The two cavities of the testicular tubes contain a very fine-grained milk-white mass, which, on pressure, oozes out at the opening of the caudal fork. This may, therefore, certainly be considered as the sexual opening. The granular mass of the testes, when viewed by the microscope, consists of very small cells, between which, when taken from the lower part, oblong corpuscles, thinned at one end, appear, of the length of 0.076''' to 0.089'', and are evidently spermatozoa. In the female individuals, the walls of the ovarian tubes are much thinner, consisting only of one simple layer of colourless cells. These have distinctly kernels, and here and there a fine-grained mass within them; they are not oblong, but rather spherical. The hollow cavity of each tube contains an innumerable quantity of eggs, glued together like bunches of grapes; each egg has a defined nucleus. In the upper portion, the individual eggs, which compose the bunches, are of an oval or pear shape; lower down, they become more rounded, encompassed by a clear space, through which they again become glued together, before and beside each other, as longer and shorter strings of eggs; the nucleus cannot now be recognised, as perhaps the white granular yolky mass conceals it. At the undermost end of the cavity of the body, in the female, was found a thin-skinned bag, of two lines long, filled with a great number of oblong moveable bodies, resembling the spermatozoa of the male *Gordii*. A milky mass oozed out, on pressure, from the opening found at the blunted posterior end of the body in the female, and which consisted of eggs and lively spermatozoa, so that the bag may be compared to a receptaculum seminis; but the reporter must add, that the individual eggs far exceeded in size the small cells of the testicular contents, and the latter certainly are only undeveloped spermatozoa.

The description which Dujardin has given of a male *Gordius aquaticus* agrees very well with that of the reporter (Ann. d. Sc. Nat. 1842, t. xviii. p. 142).

Dujardin saw no aperture for the mouth in this worm, which was not the case with the reporter. It is, however, extremely difficult to find, and

I was never able to trace a connection between this opening and either of the tubes which run along the abdomen; nay, it has sometimes appeared, that this mouth was nothing but a superficial deepening of the tender cuticle which arches the anterior end of the body. Dujardin has correctly recognised the threads of the fibrous layer situated under the epidermis, which cross each other in an oblique direction. He has not been able to find the small tubes on the two brown longitudinal stripes, held by Charvet and Berthold for abdominal and dorsal vessels. The muscular layer lying under the cuticular covering, he agrees with the reporter, in describing as composed of longitudinal fibres, which lie on each other in lamellæ. He found the cavity of the muscular cylinder filled with a cellular mass, enclosing a longitudinal canal, containing a homogeneous white mass. Under the name of *Gordius tolosanus*, Dujardin describes a new species (ibid. p. 146); but the reporter cannot perceive that it differs from *Gordius aquaticus*. He observed the epidermis of the female individuals with rounded caudal end, to be composed of many-cornered convex cells, while that of the males, with forked caudal end, had quite a different construction, as here and there, between the cells of the epithelium, larger projecting spots (disques) lay scattered. The fibrous layer following on the epidermis, the muscular layer, and the cellular tissue filling the cavity of the body, he describes in the *Gordius tolosanus*, ♂ and ♀, quite as they are in *Gordius aquaticus*. He recognised, in the individual cells of the cellular tissue, distinctly, the nucleus and the fine granular contents; he also found here, that the cellular tissue enclosed a double canal, which was filled with a homogeneous substance. It is a pity that Dujardin did not examine this exactly with the microscope, as his practised eye might have succeeded in finding out the difference between the contents of the testicular and ovarian tubes.

In this *Gordius* also, Dujardin found the head end imperforate, and covered with a transparent cape; behind the head he perceived a small opening. He gives the colour of this *Gordius* as blackish; the males, which were darker than the females, had an oblong aperture before the caudal fork, while the females were perforated obliquely at the rounded caudal end.

The specific difference between *G. aquaticus* and *G. tolosanus*, as given by Dujardin, is, that the latter possesses an epidermis minutely reticulated, and the former has no epidermis. This distinction certainly arises only from an error in Dujardin's observations.

Dujardin has described another animal allied to the *Gordius*, under the name of *Mermis nigrescens* (ibid. p. 129, and l'Institut. 1842, p. 256; also Archiv. Gén. de Médecine, t. xiv. 1842, p. 488). This worm was found very abundantly after rain, on moist ground, and sometimes also after a strong morning dew, on newly delved beds. He

believes that the *Mermis* lives as a parasite in the larva of the May-bug, and that the latter, when the ground in which it lives is moister than usual, is obliged to press its parasites out of its body, which also seek for an exit, in order to have an opportunity of depositing their eggs in the earth. He remarked, of a *Mermis* which he kept above eight days in water, that it desired to get out, and actually did escape, and laid its eggs on a dry place; where also it was dried up, and did not again revive in water. Left to themselves, they probably spend a long while in water, when they feel no farther impulse to the laying of eggs.

The *Mermis* is 100–125 mill. long, 0.5 to 0.6 mill. thick; of a white colour, with a streak shining through from its interior, out of which the eggs develop themselves. The body tapers anteriorly, and behind the head is somewhat constricted; the head itself is truncated anteriorly, and has an angular appearance, in consequence of several projecting papillæ; the tail-end is obtusely rounded. About fifteen mill. from the head is found a transverse cleft surrounded by padded margins, which represents the vulva, but it is neither connected with an uterus nor an egg-canal. The surface of the body seems quite smooth; no anus could be found. With this account, the observations which the reporter had an opportunity of making on a worm of this species, found in water at Danzig, agree pretty closely. The cuticle of *Mermis*, according to Dujardin, consists of three different parts,—1. A thin epidermis; 2. A layer of fibres that cross each other obliquely, running spirally and uninterruptedly through the whole length of the body; and, 3. A cartilage-like hollow cylinder, formed of from fifteen to thirty homogeneous and concentric layers. This cartilaginous cylinder decreases in thickness in its passage forwards, while posteriorly the thickness increases. The reporter, in the *Mermis* examined by him, has not been able to discover this structure, but he found the cylinder to be composed of two muscular layers of compressed longitudinal fibres and distant transverse fibres. Dujardin mentions the muscular cylinder of longitudinal fibres as situated under the third cartilaginous cuticle. On the head, five or six very small papillæ are observable, under which are found depressions, which are connected by small openings with the empty space surrounding the oesophagus. A broad band runs along the inner surface of the muscular cylinder, from which Dujardin supposes the eggs proceed. The reporter also observed these two bands, but cannot convince himself, that double rows of spots, of egg-germination, were present in them. The intestinal canal is simple, as from the simple mouth a narrow oesophagus passes into the dilated intestine, which is gradually lost posteriorly. The dusky stripe of the worm proceeds from the black-coloured eggs, which the reporter found enclosed in a narrow bag, but which, according to Dujardin's account, should be in connection with the above mentioned problematic ovaries. The form of these eggs is very remarkable; each consists of a colourless

round capsule, from which a fibrous funiculus arises at both poles, for attaching them to the base of the ovaries. The reporter saw the eggs with these capsules lying free in the already mentioned tubes; some of them on the one side, others even on both sides had two separate fibred cords. The darkish egg-covering enclosed in the capsule contained sometimes an embryo, which resembled the young *Nematoidea*; it had a blunt tail-end and a strongly thickened head-end, on which the reporter distinguished a protrusible prickle or bulging out œsophagus.

Dujardin gives the following diagnosis of this new genus:—*Mermis*, Corpore longissimo filiformi, elastico, antice parumper attenuato; capite subinflato, ore terminali minimo rotundo; intestino simplice, postice obsoleto, ano nullo; vulva antica, transversa. In all respects, this worm is worthy of a particular genus, which forms the transition from the *Gordii* to the *Nematoidea*. It has, in common with *Gordius*, the highly characteristic fibrous layer under the epidermis, as well as the want of an anus; while the muscular walls, with the two bands running along them, rather remind us of the *Nematoidea*, although the internal structure of this worm is still very enigmatical to the reporter.

The observations hitherto made on the *Filariæ* of insects have been collected together by the reporter (Entom. Zeit. 1842, p. 146). He has sought to direct the attention of Entomologists to this interesting subject in Helminthology, that a more exact knowledge may be acquired on these parasites of insects, which appear to differ much from the *Filariæ* of vertebrated animals, for as yet almost nothing has been said of their internal structure; they have only been sometimes superficially compared with *Filaria*, and sometimes with *Gordius*. In how far this call has had the desired effect on Entomologists, the reporter will be able to mention in next year's report; only this much may be mentioned here, that he has come to the conviction, that insects harbour various thread-shaped worms totally different from the *Nematoidea*, and one species of which is identical with *Gordius aquaticus*.

NEMATOIDEA.

A CURIOUS account has been given, in various periodicals (London and Edinb. Monthly Journ. of Med. Sc. 1842, p. 599, Froriep's Neue Notiz. Bd. 24, p. 256, and Microscop. Journ. May, 1842), of a *Trichocephalus affinis*, found in the enlarged and gangrenous tonsil of a soldier at Fort Pitt, after death. The identity of this worm with the whip-worm (peitchèn-wurm), found only in ruminating animals, cannot be received unconditionally without a more exact description.

Busk (Microscop. Journ. 1841, p. 33) has given a description and figure of the hinder part of the body of *Trichocephalus dispar*, which

is very incomplete, when contrasted with Mayer's copious work on the same subject (Jahresb. 1842).

De la Harpe (Gurlt und Hertwig's Mag. f. Thierheilk. 1842, p. 14) found, in the fatty degenerations of sheep's lungs, a complication of very small worms and clusters of eggs, which, he could not doubt, proceeded from *Strongylus filaria*, a parasite, that, at the same time, covered the lungs in great number.

Rayer has published an excellent paper on Worm-aneurism and the *Strongylus armatus minor*, Rud. (Archiv. de Méd. Comp. par Rayer, Paris, No. 1, Oct. 1842, p. 1; Recherches Critiques et nouvelles observations sur l'Aneurysme Vermineux, et sur le *Strongylus armatus minor*, Rud., par Rayer; and Froriep's Neue Notiz. Bd. 28, p. 223).

According to Rayer's investigations, the worm-aneurism almost always develops itself, in *Solidungulous* animals, in the arteria mesenterica anterior, and generally in adult and old individuals. He found the cavities of the aneurismal dilatations sometimes narrowed, or quite filled up by a growth of fibrous layers; in the smaller depositions of these layers only few *Strongyli* were present, but in those of larger size, they were found in greater number; they were often also met with in the ossified arterial walls of the aneurism. Rayer has never seen the internal arterial coat of such worm-aneurisms perforated or ulcerated; the worms remain between the layers of the fibrous deposition, never between the coats of the artery. Worm-aneurisms, it is believed, do not burst, as they are always accompanied by hypertrophy of the arterial walls; but Rayer, in opposition to this opinion, asserts, that the *Strongyli* pierce the walls of the arteries and so get into the cavities. He also objects to the assumption of Morgagni, Rudolphi, Laennec, Otto, and others, that the tubercles in the walls of arteries, containing *Strongyli*, cause the formation of aneurism, as such tubercles are only found in dogs and without aneurisms. The most of the *Strongyli* are found in the fibrous deposits, and project sometimes with the head, sometimes with the tail; only a few lie free in the aneurismal cavities. The red colour of these worms does not proceed from the blood sucked in, but from resting upon it and being washed with it. The description of the worms themselves contains nothing new. A case of aneurism has been given by Gruby, in the coeliac trunk of a horse, in the cavity of which fibrous deposits and *Entozoa*, resembling *Ascarides*, were found; certainly, however, they could have been nothing else than individuals of *Strongylus armatus minor*.

Leuckart found a *Strongylus* in the small intestine of *Myoxus glis* (Zool. Bruchst. iii. Helminthol. Beitr. 1842, p. 38), which he has characterized as *St. gracilis* in the following way:—Capite exiguo, elongato, obtusiusculo, alato; ore orbiculari; bursa maris ampla, costulata, margine leniter incisa; feminæ parte corporis posticæ crassiore, in mucronem (caudam) tenuiorem depressum excunte. The colour is

brownish-white; the length of female 4"', of male 3"'. He has also discovered another interesting round worm in the frontal sinus and cribriform bone of *Mustela putorius* and *foina* (ibid. p. 43), which appears to belong to *Spiroptera*, and has been furnished with the following diagnosis: *Sp. (?) nasicola*.—Capite indiscreto, ore orbiculari nudo; maris parte corporis posteriore recta, alis brevissimis, pene mediocri, cauda post alas brevissima apice aculeo armata; feminae cauda acuta, vix distincta, parum inflexa. The hinder part of the body in the male is not spiral; the colour of these parasites is red; the length of male 5-6"', of female 8-12"'. Leuckart observed a short pointed prickle projecting from the posterior end of the body in the male, which he considers as an organ of incitement, and which, perhaps in copulation, assists in holding fast the female. The digestive canal is provided with a short cesophagus, narrow anteriorly, dilated posteriorly, which passes into a stomach and intestine; the sexual parts are the same as in *Ascaris* and *Strongylus*; the females are viviparous. He found, likewise, a round worm, agreeing with *Ascaris incisa*, enclosed in a peculiar transparent membrane, fastened to the abdominal fur of *Sorex tetragonurus* (ibid. p. 39). The worms were 5-9"' long, and no sexual organs could be distinguished in them, which seems to confirm the opinion of Creplin, that no round worm, enclosed in a membrane, possesses such organs.

Mayer (Neue Unters. aus dem Geb. der Anat. and Phys. 1842, p. 9) has seen, in female individuals of *Oxyuris vermicularis*, a very great number of seminal animalculæ of the length of $\frac{1}{16}$ "'; they lay between the eggs, in a crooked shape, with pointed ends.

Gluge has found the eggs of the *Ascaris nigrovenosa* in the lungs of frogs, without any trace of that entozoon in these organs (l'Institut. 1842, p. 131, and Archiv. Génér. de Méd. t. xiv. 1842, p. 364). He consequently believes, that these eggs were taken into the lungs in respiration, and looks on this phenomenon as an argument against spontaneous generation. Mandl has made the same observation, and drawn from it the same conclusion (Froriep's Neue Notiz. Bd. 23, p. 200); his account, in fact, agrees so exactly with that of Gluge, that one might suppose there was a mistake in the name of the author.

A new case of worm-abscess, observed by Hecking at Waxweiler on the Rhine, is to be added to those mentioned in former reports (Preuss. med. Vereinsz. 1842, No. 42, p. 187). He had to poultice an inflamed swelling of the navel in a girl of four years old, and when the tumour burst, three dead maw-worms with eggs escaped; the navel closed, but after two months another painful tumour occurred, which went on to suppuration, and again discharged some maw-worms.

Farther observations have been made on *Entozoa* in the blood of the vertebrata. Vogt has discovered a quantity of *Filaria*-like worms in the blood-vessels of several frogs (Müller's Arch. 1842, p. 189), as Valentin

has formerly done (v. Arch. 1840, ii. p. 189, and 1841, ii. p. 342). He also found, like Valentin, the coverings of the pupæ, or cysts, in the cavity of the body of the same frogs: many of these cysts contained *Filaria* similar to those in the blood. If the cysts in the intestine were whitish-coloured, they contained small *Filaria*, and no worms were found in the blood; but if the cysts were brown, they were then without *Filaria*, and the blood was full of them. Their head was truncated, the tail-end pointed, and in their interior, Vogt could distinguish an intestinal canal and ovary. This ovary, in the opinion of the reporter, could have been nothing else than the remains of the yolk, which remains for a longer while, as a cellular mass, in the already escaped embryos of the *Nematoidea*. Vogt found, in the abdominal cavity of a frog, two gross of female *Filaria* more than an inch long, with developed sexual organs, swollen with eggs and embryos. As the latter resembled the little worms observed in the blood, Vogt thought that the presence of these *Filaria* in the blood of frogs might be explained as follows:—The pregnant females deposit their brood in the abdominal cavity; the young perforate into the great vessels, circulate for a while with the blood, and at last become fixed to a particular spot; they now become surrounded by fibrous layers, and, after attaining to maturity in their cysts, break through into the abdominal cavity, in order there to deposit their young. Whether these *Filaria* do attain to maturity in the cysts the reporter very much doubts, as neither he nor Creplin have found encysted *Nematoidea* with the sexual parts developed.

Miescher has seen the small *Nematoidea* described by Vogt almost uniformly in the blood of frogs (ibid. p. 191).

The reporter may add, from a treatise by Charles Lee, which he has just seen, that a *Filaria papillosa* was observed in the anterior chamber of the eye of a horse at New York, which seemed to occasion no uneasiness to the animal, and only rendered the aqueous humour muddy. (Sillim. Amer. Journ. vol. xxxix. 1840, p. 278.)

Barkow (Übers. der Arbeit. and Veränd. der schles. Gesellsch. für vaterl. Kult. 1839. Breslau, 1840, p. 93) has hazarded the conjecture, that the *Entozoa* of those warm-blooded animals which hybernate, do also fall into the dormant state when the lower temperature of their habitation renders them less inclined to motion. He found, in the stomach of a hedgehog, killed during its winter sleep, several specimens of *Physaloptera clausa*, without any signs of life, but which became lively so soon as they were placed in warm water.

Steenstrup has hinted (Op. ant. cit. p. 110) that *Sphærulearia bombi* (v. Arch. 1838, ii. p. 297) may perhaps be the nurses (keimschläuche, germ-bags) of certain *Nematoidea*, an opinion which the reporter finds improbable, since *Sphærulearia* possesses distinct sexual parts with real eggs, which had entered on the process of evolution.

Henslow has given several notices on the remarkable *Vibrio tritici* (Microscop. Journ. Lond. 1841, p. 36), which confirm the observations of Bauer on this worm's tenacity of life. Henslow saw dried heaps of these worms come to life again in water, even when taken from ears of wheat of six years old. Eggs and young *Vibriones*, however, when once dried, always remain dead. The worms appear not only in wheat, but also in rye, oats, and barley, when these sorts of grain are sown along with wheat affected by *Vibriones*; but they do not spread over these crops in the same degree as over wheat. They are killed in the grain by scalding with hot water, which procedure Henslow proposes as a remedy for the disease.

Schiödte has observed *Filaria* from $\frac{1}{8}$ – $\frac{1}{3}$ of a line long in the stomach of *Carabus clathratus* and *Calosoma sericeum* (Genera og Species af Danmarks Eleutherata. Kjöbenhavn, 1840–41, i. p. 82). He found *Entozoa* only twice in *Dytisci*, although he dissected a great number of them (ibid. ii. p. 412). In the one case the worm was a pretty large *Filaria*, which was found in considerable numbers in the head of a *Dytiscus marginalis*; in the other instance, the worm, of only one line long, with pointed posterior end, and without distinct intestinal canal, belonged to no genus yet characterized. This parasite lay concealed under the external muscular tunic of the crop of an *Acilius sulcatus*.

Gruby, who found *Filaria*-like worms in small sacs of the peritonæum of frogs, of $\frac{1}{8}$ – $\frac{1}{4}$ millim. in size, also saw the eggs of *Entozoa* circulating with their blood, and in the dorsal canal (l'Institut. 1842, p. 239. Arch. Génér. de Médecine, t. xiv. 1842, p. 483, and Froriep's Neue Notiz. Bd. 24, p. 136). He found, besides, *Ascarides* in the sheaths of the primitive bundles of nerves, and even between the primitive threads of the latter; they moved slowly, and were $\frac{1}{30}$ – $\frac{1}{40}$ millim. in length. They were surrounded in the lungs by a yellow, hard, and convex substance. After Gruby had injected eggs of *Entozoa*, mixed with serum, into the great muscular cutaneous vein of the frog, he saw them standing still in the capillary system of the organs, particularly of the lungs; but he could follow the development of the embryo in them. The eggs became surrounded by exhaled coagulable matter, which forms the yellow substance in the lungs.

ACANTHOCEPHALA.

STEENSTRUP considers most of the *Echinorhynchi* hitherto known as nurses (keimschläuche) (Op. ant. cit. p. 111); but in this he goes too far, for they possess fully-developed sexual parts, and are, besides, of different sexes; while the nurses, according to Steenstrup's view, bring forth their brood independent of ovaries, or copulation with male organs.

That Steenstrup found small *Echinorhynchi* within separate capsules on the mesentery, liver, and intestine of a plaice, is a new voucher in proof of the nomade habit of these animals.

TREMATODA.

CREPLIN has described a new *Monostomum* (*M. expansum*), from the upper portion of the small intestine of a river-eagle (Flussadlers), which is distinguished by the fore-part of the body being extraordinarily flattened and broad (Arch. 1842, i. p. 327). In the broad part Creplin observed an organ composed of granular balls; the very small mouth had an acetabulum, and a still smaller pharynx, from which the oesophagus ran to the middle of the anterior part of the body; from this spot, on each side, an intestine went down to the end of the hinder part. Two vascular trunks stretching down on the inner side of the intestinal tubes, which, in one specimen, contained in some places white coagulated masses, are perhaps the organs of excretion that discharge posteriorly, and which the reporter has met with in different *Monostoma*. The dendritic ovaries begin in the latter half of the flat fore-part of the body, and stretch on both sides to the extremity. The wide uterine canal, the commencement of which Creplin could not find, runs with many windings through the anterior half of the hinder part of the body; the end of the uterus must perforate a pear-shaped white knot in the posterior margin of the body, and then open externally on the middle of the abdominal side. The brown eggs of the uterus are pretty large, oval, with a small knot at the narrowed end. The two testes, lying behind each other in the posterior part of the body, have very deep indentations, by which they seem divided into radiated, or fan-shaped branches. Creplin could trace only one vas deferens, and that from the posterior testis: it passed into two spiral seminal receptacles before it ended in the receptaculum cirri. It is to be lamented, that this extremely flat worm could not be examined when alive.

Monostomum mutabile has been figured by Leuckart (Zool. Bruchst. op. ant. cit. iii. p. 35), with the remark, that Nitzsch had sent him, under the name of *Monostomum aspersum*, a parasite from the nasal sinus of *Anas fuligula*, which was very nearly allied to the *Mon. flavum* of Mehlis.

Mayer has recognised flickering movements in the vascular system of *Amphistomum subclavatum* (Neue Untersuch. ant. cit. p. 247). The black balls which Mayer saw in canals, forming an arch at the posterior part of the body, and considered as ovula, or yolk, are the excrements of the excreting organ of this worm, which discharges at the hinder part

of the back. These little balls appear blackish coloured when the light falls through them, and white when it falls on them.

Distomum hepaticum has been found by Duval in the vena portarum, and its hepatic branches, of a man, to the number of five or six individuals; from 11-14''' long, and 4-5''' broad (Gaz. Med. de Paris, 1842, No. 49, and Zeitschr. f. die gesammte Mediz. v. Oppenheim, Bd. 23, 1843, p. 86.)

A *Distomum*, discovered by Otto in the *Squalus griseus*, has been more correctly described by Creplin as *Dist. veliporum* (Arch. 1842, 1, p. 336). Its size is somewhat above three inches. The abdominal acetabulum lies very far forward, so that the neck is only 3''' long; on the middle of the latter the genital pore projects, like a little hillock. The excretory pore is distinctly placed at the end of the after part of the body. Creplin remarked, in that part of this animal, three broad bluish spots, situated behind each other. The two posterior evidently proceeded from the two testes, the third and foremost led from the organ of egg-germination, which the reporter has not yet missed in any *Trematoid* worm. The eggs of this *Distomum* are very small, slender, roundish, oval, and brown coloured.

A new parasite has been found by Leuckart in the frontal sinus and labyrinth of the cribriform bone of *Mustela putorius* (Zool. Bruchst. iii. p. 33) which he has described in the following way:—Corpore tereti, ovato, antice crassiore, rotundato-obtuso, postice attenuato, acuto; poris orbicularibus, poro antico parum prominente, poro ventrali majore; collo nullo. Its length was 1½'', its colour brown. He also discovered another *Distomum* in the kidneys of *Sorex fodiens* (ibid. p. 34). He calls it *Dist. truncatum*, and gives the following diagnosis:—Corpore tereti, antice crassiore, rotundato-obtuso, postice attenuato, truncato-obtuso; poris remotis, poro antico orbiculari, non prominente; poro ventrali minore, apertura transversa; collo nullo. Its length was 2'', and it was also of a brown colour.

Gluge observed, in the *Polystomum integerrimum*, a number of cells with nuclei and nucleous bodies, some of which were again enclosed in cells (Hæser. Arch. f. die gesamt. Mediz. 1842, p. 492); but he could not say if these cells had any relation with the development of the eggs.

We learn from Yarrell, that twenty specimens of the rare parasite, *Tristomum coccineum*, were found on the outer upper surface of the head of an *Orthogoriscus mola*, caught on the English coast (Hist. of Brit. Fishes, ii. p. 468).

Leuckart has characterized a new genus of *Trematoda*, under the name of *Diplobothrium* (formerly only provisionally called *Diclibothrium*) under the following diagnosis: (Zool. Bruchst. iii. p. 13):—Corpore molli, elongato, depresso; acetabulis sex anterioribus, media valvula in duas foveolas divisio, lateralibus, utrinque tribus; rostro inter

acetabula porrecto, ore antico, simplice. The only species was discovered by Leuckart and Kollar on the branchiæ of the *Acipenser stellatus*, Pall., and was called by the former *Diplobothrium armatum*. It has been specifically characterized:—Corpore postice incrassato; rostro uncinato, uncis quatuor horrido; acetabulis pedunculatis, lincatis, margine ciliatis, aculco armatis. This worm has been already mentioned as *Diclibothrium crassicaudatum* and *armatum* (Wiener, Ann. 1. p. 82), and by Nordmann as *Hexacotyle elegans* (Lamarck, Hist. Nat. t. iii. 1840, p. 600). Leuckart does not allow the species *Hexacotyle Thynni*, *Hexathyridium pinguicola*, Treutl., Blainv., and *Hexabothrium appendiculatum*, Kuh., Nordm., but reckons them with *Polystomum*. The *Diplobothrium* is distinguished from these *Trematoda* principally by the clasping-organs at the anterior end of the body. The reporter, in this respect, would rather agree with Nordmann's view, and consider the acetabula also in *Diplobothrium*, as belonging to the after part of the body. If the two figures be compared which Leuckart has given of *Diplobothrium armatum*, and *Octobothrium leptogaster*, to be afterwards mentioned, a similarity in external appearance of the two worms will be obvious, except that the one has six and the other eight clasping-organs. In *Diplobothrium*, the part furnished with the six acetabula is the anterior end of the body. It must therefore strike us, that the same clasping apparatus, which in one animal is placed on the after part of the body, is, in another allied to it, on the fore part. The circumstance, however, of Leuckart having seen a distinct opening on the point between the projecting clasping-organs, makes me hesitate in agreeing altogether with Nordmann; on each side of this opening, considered by Leuckart as a mouth, are a couple of considerable horn-like hooks, directed backwards. *Octobothrium lanceolatum* has similar hooks at the end of the posterior part of the body. In *Diplobothrium*, behind these on each side, are three clasping-grooves, between which, the body elsewhere thin, is somewhat broader. In each groove is found a considerable number of fine white transverse striæ; and from the middle projects a white striated membrane, like a sort of valve; each groove is also provided with a projecting clasping-apparatus-like claws. Of the inner organs, Leuckart has observed an intestinal pouch, simple at the beginning, and afterwards forked. The eggs, which were noticed in the opposite end of the body, had an oval shape and brown colour. Leuckart has characterized his genus *Octobothrium* thus:—Corpore molli, elongato, depresso; apertura oris antica, infera, simplice; acetabulis in utroque corporis partis posticæ latere quatuor.—Leuckart refers *Octobothrium merlangi*, Nordm., to this genus also, although Nordmann has directed attention to the fact (Micograph. Beiträge, 1, p. 79), that this parasite has not eight acetabula, but only eight clasping-organs unprovided with an acetabular apparatus. The character of the genus will, therefore,

require correction in this respect. Leuckart mentions, in all, six species of *Octobothria*, among which three are new,—*Octoboth. leptogaster*: *Corporis parte anteriore latiore, lanceolata, posteriore tenuissima, filiformi*; *acetabulis anterioribus nullis, posterioribus subpedunculatis, fibulatis*. Rapp found it on the branchiæ of the *Chimæra monstrosa*. The frame of the clasping-organs here reminds us of *Diplozoon paradoxum*.—Another new species was found by Rapp on the branchiæ of the *Gadus molva*, and described by Leuckart as *Octoboth. palmatum*:—*Corpore antice et acetabula versus attenuato, medio latiore*; *acetabulis anterioribus nullis, posterioribus fibulatis, pedunculatis*; *pedunculis elongatis, utrinque palmæ formam mentientibus*. The double cæcum of this worm forms, on each side, a beautiful vascular net. The sexual opening is placed behind the mouth. The ends of the eight pedicels, of the after part of the body, have a groove, which can be opened and shut by an anterior and posterior valve-shaped dilatation. The margins of these valves are, as in *Diplozoon*, bordered by amber coloured pieces of horn. The eggs are proportionably large, oval, of a brownish-yellow colour, and provided with a lid. The length of the worm is 7-8'''', and its breadth 1½''''.—A third new species is *Octoboth. sagittatum*: *Corpore antice attenuato, postice latiore, sagittiformi*; *acetabulis duobus anterioribus ori proximis, posterioribus fibulatis, sessilibus*. This worm is a parasite on the branchiæ of *Salmo fario*, and has been first mentioned by Schultze and Zähringer, under the name of *Cyclocotyle lanceolatum*. Two brown lateral vessels form the intestine, which send off ramifications outwardly; the part of the body provided with clasping-organs is constricted; the four suction grooves, on each side, are very close together; each has two valves, an anterior and posterior, the margins of which, as in *Octoboth. palmatum*, are bordered with several pieces of horn. The hook which the *Octoboth. lanceolatum* possesses at the sexual opening, could not be perceived; a canal passing anteriorly contains very large eggs. The length of the animal is 3-4''''. Leuckart adduces *O. lanceolatum* as a fourth *Octobothrium*, and *O. scombræ* as a fifth; but, in my opinion, this cannot be specifically distinguished from *Octoboth. lanceolatum*. *Octoboth. platygaster*, Leuck. (*O. Merlangi*, Nordm.), has been enumerated as a sixth species; and as a seventh, the *O. hirudinaceum*, Bartels, is left doubtful. Of *Cyclocotyle belones*, which Nordmann and Creplin enumerated with the *Octobothria*, Leuckart has mentioned nothing definite.

From Steenstrup's ingenious work (*Über den Generationswechsel*, p. 50), it is now evident that the *Cercaria*, hitherto placed as a separate genus, is only a larva-state of different *Trematoda*, subject to transmutable generation. In this condition the *Trematoda* are provided with a tail-like apparatus, by the serpentine movements of which the animal pushes itself on, quivering in the water.

Steenstrup first made his observations on *Cercaria echinata*, Sieb., from *Planorbis cornea*, and *Lymnæus stagnalis*, and described it so exactly, that the reporter knew it at once to be the *Cercaria*-first mentioned in Burdach's Physiology. The internal cavity, with contractile walls in the after part of the body, he incorrectly looks upon as the end of the root of the tail. This is situated not nearly so deep in the after part of the body of the *Cercariæ*, and only encloses the opening of the cavity mentioned. According to the reporter's observation, the wide-extended aperture, at the root of the tail, contracts itself when that part falls off, and then represents the spot for the discharge from the excrementary organ. The smaller circular speck, which is situated before the cavity, and looked upon by Steenstrup as an opening, is only a spot enclosed by the contractile walls. Steenstrup has made the following remarks on this *Cercaria echinata* :—In swimming, each *Cercaria* rolls its body into a ball, approximating the head to the tail-end, and beats about with the elongated tail in innumerable S-shaped figures. These larvæ swarm for some time around the snails from which they have come forth, and fasten themselves, by means of the abdominal acetabulum, to their slimy cuticle, and then stretch out the fore and after part of the body. After a time they begin, with leech-like motions, to creep about upon the cuticle of the snails; when again they become fixed, and by wriggling strongly up and down, they endeavour to loosen the tail. When they have succeeded in this, it dies away, and the *Cercaria* assumes the appearance of a *Distomum*. During the attempts to cast off the tail, an abundant secretion of slime exudes from the whole upper surface of the body; and the tail being cast off, the worm, by manifold movements and turnings, makes for itself a circular cavity in this slime, that gradually thickens into a case around it. Steenstrup is of opinion, that in doing this, the animal denudes itself of a very thin cuticle, which the reporter is inclined to doubt. The former grounds his opinion on this, that after the formation of this covering, all the internal organs of the *Cercariæ* become more distinct; but the reporter would explain this fact, by the emptying of the slime-glands of the cuticle making the body of the animal more transparent. This *Distoma*-like worm possesses, at the anterior end of its body, a sort of cape, which is deeply emarginate on the middle of the abdominal side: on this stand the simple prickles or needles, from which the *Cercaria* derives its specific name. They are situated at greater and lesser distances, alternating regularly, in a double concentric circle, the pointed ends directed outwards, and the blunt ends inwards to the mouth. The large abdominal acetabulum is placed somewhat behind the middle of the body. Steenstrup next describes a large bladder-like organ in the interior of the *Cercariæ*, which begins close to the margin of the cape, runs down to the abdominal acetabulum in the middle of the neck, and then splits

into two side-branches, which stretch to the end of the after part of the body. He considers this organ as the liver, and conjectures, that the intestinal canal, formed conformably to it, is situated under it. The reporter would here add, by way of explanation, that this series of cells is the intestine not yet completely developed, and that it afterwards loses all this cellular appearance, and then represents a closely-bounded, forked, blind canal. Steenstrup observed two spiral organs running along both sides of the anterior part of the body, and disappearing in the neighbourhood of the abdominal acetabulum. He does not give any opinion on the use of these lateral canals, which form at the same time a ring round the pharyngeal tube. The reporter has also observed them, and discovered their blind terminations near the abdominal acetabulum; they also appeared to him to discharge themselves into the bottom of the acetabulum of the mouth, so that they may perhaps be compared to a salivary gland, or some other organ of secretion, *e. g.* a spinning or a poisonous organ. These side-vessels do not form meshes; and if Steenstrup has seen them, they must have been meshes of blood-vessels, which are present in all fully-formed *Trematoda*, and at times can be distinctly observed in the larva of many *Cercariæ*. Another organ, which passes along the body from beneath, with two lateral branches, is the excrementary organ, and must not be confounded with the anterior lateral vessels. When the *Cercariæ* have arrived at the point of becoming pupæ, they progress so rapidly, that they do not wait till they have penetrated the body of the snail which they have selected for their future abode, but pass into the state of pupæ upon the cuticle. Up to this period the habits of *Cercariæ* have been long known; but Steenstrup has followed them farther. In the state of pupæ they remain long in an unaltered condition; after several months he found them still the same, while the anterior end of the body became covered by a number of small-pointed prickles. He saw such individuals free in the parenchyma of the snail. Some had still a wreath of spines at the mouth, others had lost it, but in all the intestinal canal was very much dilated. The pore visible at the upper end of the cesophagus, mentioned by Steenstrup, can only be the head of the pharynx, which does not always lie close in the acetabulum of the mouth, but is sometimes observed at a distance from it. The organs, which he saw filled with little balls on both sides of the body, above the abdominal acetabulum (tab. ii. fig. 8, e. and 8 f.), are the superior blind ends of the excrementary organ. Thus far Steenstrup's direct observation of the metamorphosis of the *Cercaria echinata* extend. How the small *Distomum* which comes from this *Cercaria* farther develops itself, he infers only from analogy with other *Trematoda*, which in the perfect state produce a brood of young, resembling *Infusoria*. From these young, then, as is shown by the observations of Bauer, Bojanus,

and the reporter, the germ-pouches proceed, in which new *Cercaria*-like larvæ are developed, by which this chain of metamorphoses, passing through several generations, is closed. Of the origin of the *Cercaria echinata* there can be no doubt: they are produced from the Königsgelben Würmern (Eng. king's-yellow worms), as Bojanus and the reporter have observed. These worms, formerly observed by Naturalists as germs of the *Cercariæ*, Steenstrup defines as the matrice of the *Cercariæ* and *Distoma*. He is in doubt whether they possess particular openings for emitting their brood of *Cercariæ*. However, it seemed to him, that two openings were to be found on the constricted band of the matrice of *Cercaria echinata*. The reporter can assure him, that the matrice of some species has no definite aperture for emitting their brood, while others have a peculiar sphincter behind the opening of the mouth, through which they are protruded. Steenstrup has often observed, in the winter months, the origin of the young matrice, which the reporter was seldom lucky enough to do. In this season were found many matrices, which contained nothing but young matrices, in the most various stages of development. They developed themselves like *Cercariæ*, also out of round granular germs. He farther conjectures, that these matrices, which may equally be considered as the first matrices of the *Cercariæ*, do not again proceed from matrice-like animals, but from the eggs of *Distoma*; but, as he could not explain the chain of metamorphoses of *Cercaria echinata*, by direct observation, he left it, and appealed to the brood of *Monostomum mutabile*, which, according to the reporter's observations, consists of infusoria-like young, which all contain a creature very like the matrice of the *Cercaria echinata*. Steenstrup certainly conjectured rightly, that in these matrice-like animals, not the larvæ of *Monostoma* but of *Cercariæ* were developed, from which afterwards the complete *Monostoma* proceeded; he also referred this supposition to the *Cercaria echinata*, in order to fill up retrogressively the gap in the series of the metamorphoses of this animal, the transition from the brood of the *Distoma* to the first matrices of the *Cercariæ*. The reporter cannot entirely agree with Steenstrup, that the *Cercaria echinata* is the larva of a *Distomum* accomplishing several metamorphoses, and only wishes that this conjecture were confirmed by direct observation; but he cannot help remarking, that the metamorphoses of the *Cercariæ* to the perfect *Distomum*, could with difficulty take place in the small itself. The reporter also doubts, if the *Distoma* figured by Steenstrup, without a constricted throat (tab. ii. fig. 8 e. and 8 f.), actually belong to the series of metamorphoses of the *Cercaria echinata*; he expects at a future period to publish his grounds for this doubt in a separate essay; but the following may be here remarked:—If we compare the armed *Distoma* (*Dist. echinatum*, *uncinatum*, *militare*, &c.) found in the intestinal canal of water fowls

with the tailless *Cercaria echinata*, the resemblance of these animals, especially of the head and wreath of hooks, is very striking; and if we remember the interesting observation of Creplin, that the *Schistocephalus dimorphus* (Nov. Observat. de Entoz. p. 90) first gains its sexual organs, after it has been transplanted from the stickleback into the intestinal canal of the water fowl, we must be led to assume, that the sexual organs of the pupa of *Cercaria echinata* do not become completely developed until it has arrived in the intestines of those water-fowl which feed on snails, and then grows up to one of the above named armed *Distoma*. Steenstrup next turns to the metamorphoses of the *Cercaria armata*, Sieb., on the anterior part of the body of which he saw, on both sides, a serpentine organ, which, as the reporter conjectures, discharges itself at the anterior end of the body, as in *Cerc. echinata*; perhaps the same opening serves for an exit to both those secreting pouches, from which the point of the prickle of the head projects. The forked intestinal canal of these *Cercariæ*, and the posterior excretory organ, have not been mentioned by Steenstrup. He saw the shells of *Lymnæus stagnalis* and *Planorbis corneus*, not merely surrounded by monstrous swarms of these *Cercariæ*, but also their bodies thickly covered by them. The *Cercariæ* creep about upon them, and penetrate, by means of their prickle, into the cuticle, that they may cast off their tail; when this takes place, the inner caudal tube is constricted, and receives, according to Steenstrup's account, an aperture outwards, through which the animal then presses out a fluid, filled with globular masses. The reporter does not take this view. The cavity which contains the granular fluid does not belong to the tail of the *Cercariæ*, but is the very short forked excrementary organ, situated in the posterior part of the animal's body, the aperture of which is stopped up by the root of the tail, as in the other species of *Cercariæ*. After they have penetrated into the cuticle of the snails, they become pupæ, while they excrete a slime from their whole surface, and at once strip off their upper skin together with the prickle. The *Cercariæ* remain very long active and fresh in this state of pupa. We cannot help wondering how Steenstrup could consider the tailless *Cercaria armata* changed into a *Distomum* quite reversed. He describes its short forked posterior excretory organ (tab. iii. fig. 4 f. u. g., 4 d. u. e., a. y.) as the intestinal canal; and the double cæcum, going right and left from the head of pharynx (tab. iii. fig. 4 f. u. g., v. x. x.), he considers as an organ for the service of propagation. The great acetabulum of the mouth (tab. iii. fig. 4 f. u. g., 4 d. u. e. s. t.) is to him quite a mystery; as, misled by optical delusion, he looks upon the section of the muscular walls as a peculiar horse-shoe-formed organ, and the proper opening of the mouth as the aperture of the posterior excretory organ. A *Distomum*, which had slipped out of its covering (tab. iii. fig. 5 a.), he also got hold of in the same way reversed;

he now assumes of the *Cercariæ* become pupæ and changed into *Distoma*, that they grow strong after becoming pupæ, and acquire a lancolate shape, as the fore-part of the body is strongly contracted, and the pupal covering at the same time much thickened. The very thick skinned *Helminthes*, to which Steenstrup next refers, and which he has figured on tab. iii. fig. 5 e. f. u. g., do not belong to the series of the metamorphoses of *Cercaria armata*. These *Helminthes* are very remarkable *Trematoda*, without sex, which the reporter has often met with between the nests of *Cercariæ* in *Planorbis* and *Lymnæus*; the irregular net of canals, which contains a granular fluid, is the very much dilated excretory organ of these *Helminthes*, and widely different from the simple short forked one of the *Distoma* which come from *Cercaria armata*. Between the acetabula of the mouth and abdomen of these animals two semicircles are observed, which Steenstrup considers as the broad ends of the cavity of digestion; but they are two openings obliquely perforating the thick cuticle, and leading to a groove in the parenchyma of the worm. Steenstrup has been more happy in pursuing the metamorphoses of *Cercaria* retrogressively; he has succeeded in recognising, in their matrices, which have hitherto been esteemed as immoveable simple pouches, a slight voluntary motion, as well as a sort of acetabulum at the one end, and an opening for parturition at the other.

In their youngest state, they contain a cellular mass; in the gradual development of the *Cercariæ* the motion by degrees ceases. Steenstrup, as well as the reporter, has observed the *Cercariæ* becoming pupæ before they leave the matrices, and appeals to the large thick-skinned *Trematoda* which he has found in the matrix-bags. These *Helminthes* have also been seen by the reporter in the matrix-bags of the *Cerc. armata*, as well as *echinata*, and must, as already mentioned, be considered as parasites not belonging to the series of metamorphoses of these *Cercariæ*. Steenstrup has not hitherto been able to perceive the first matrices (Gross-ammén) of the *Cercar. armata*, that is, such matrix-bags as contain young pouches; he farther mentions, that he obtained several individuals of one *Distomum* from the liver of a *Paludina vivipara*, which he holds for the same species into which the *Cercar. ephemera*, Nitzsch, changes on becoming pupa. This is not likely, as the *Cercar. ephemera* wants the abdominal acetabulum; and, accordingly, this larva could only be changed into a *Monostomum*. Nitzsch has erroneously ascribed an abdominal acetabulum to this *Cercaria*. Steenstrup next describes a small oval animal, which moves by vibratile cilia, and in all respects resembles the brood which comes from the eggs of *Distoma*, and first becomes transmuted into a *Distoma*-like animal in the third generation. It lives in the internal organs and external slime of *Anodonta*, and much resembles a *Paramecium*. The individuals gradually lose their vibratile cilia, fix themselves, and become more parenchymatous; as they grow, a cavity is formed in their interior, which becomes, by degrees, filled

with small round or oval bodies; these are the germs of *Distomum duplicatum*, Baer, which Steenstrup could not observe becoming pupa. He adds to these observations, that the tailed *Distom. duplicatum* is very probably the larva of *Aspidogaster conchicola*, Baer. The reporter considers this conjecture as entirely groundless; the tailed *Distom. duplicatum* can only change into a *Distomum*. It possesses, like all of them, a forked intestinal canal, and an abdominal acetabulum. *Aspidogaster* has not an abdominal acetabulum, and is only furnished with a simple intestinal pouch. The brood also of *Aspidogaster*, which the reporter has frequently observed, does not at all agree in form with those creatures of the *Paramecium*-kind from which Steenstrup asserts that the matrice for *Distom. duplicatum* proceed. Its young are provided with a distinct acetabulum of the mouth, under which the anterior end of the body projects like a moveable tongue, and already points to the shield-formed abdominal plate of the grown animal. Steenstrup correctly explains, in opposition to the assumption of Carus, that the pouch-like beings, which have been named *Leucochloridium paradoxum*, proceed, by equivocal generation, from the parenchyma of the *Succinea amphibia*; that these pouches are the nurses of certain *Trematoda*, and, in his opinion, owe their origin to ciliated animalcules, resembling the *Opalina ranorum*.

Steenstrup found, in the eyes of fishes, *Trematoda*, not only free but shrivelled up, which were fixed to the inner wall of the cornea of a pike (*Hechtes*) and of a perch (*Barsches*), and to which a fine granular unorganized stripe ran through from the external surface, which might be looked upon as the way by which the *Trematoda*-like little animal got from the outside into the fish. As he also found such *Trematoda* become pupa in the neighbourhood of the eyes of fishes, he looks upon this to be a proof, that the *Diplostoma*, *Holostoma*, and *Distoma*, living as parasites in their eyes, are different links of one series of metamorphoses. He explains the *Diplostomum clavatum* to be the larva, *Holostomum cuticola* the pupa, and *Diplostomum volvens* the full grown *Trematodum* of one and the same series of metamorphoses; with which the reporter does not agree, as these three *Trematoda* are formed differently from each other, and no trace of sexual organs can be recognised in the *Diplostomum volvens*. Whether the *Trematodum* found enclosed, in the state of pupa, under the cuticle and in the mesentery of the *Rana temporaria*, be the pupa of *Amphistomum clavatum*, as he imagines, would need more proof. The reporter has often found the same sort of capsuled *Trematoda* in frogs; but he always held them for *Distoma* without sex, never for *Amphistoma*.

A laboured article by Streubel, on the genus *Pentastomum*, in Ersch and Gruber's "Encyclopædie 16r Theil. 1842, p. 93," which has hitherto contained distinguished original essays on the *Helminthes*, is almost only a meagre extract from Diesing's Monograph of this genus.

A very singular parasitical worm, which the reporter knows not

where to classify, has been described and figured by Rathke, under the name of *Peltogaster paguri* (Neuest. Danz. Schr. Bd. iii. Hft. 4, p. 105). The animal lives on the abdomen of the body of the *Pagurus bernhardus*, is 6''' in length, and forms an elongated arched crooked oval, the thicker end of which passes into a short wide tube; the margin of the aperture of this tube, which is the mouth of the animal, appears padded and somewhat undulated. Cirri and eyes are wanting, the epidermis is thick and colourless, and in the middle of the body there is an abdominal acetabulum, in the form of an amber-yellow radiated emarginate shield of a horny texture, on a horny longitudinal stripe. The presence of this acetabulum, with which the parasite is fastened to the body of the crab, induced Rathke to reckon it with the *Trematoda*. Through the mouth we arrive at a very wide intestinal pouch, which reaches to the end of the body, and is every where fastened to its walls by cellular tissue. The worm does not prey upon the juices of the *Pagurus*, but sucks the nourishment which is conveyed to it out of the water. The intestinal pouch serves also for hatching the eggs. In young individuals, the inner surface of the pouch, towards the back, is covered with soft flat masses of fibres; in older ones these spots are occupied by some layers of eggs, which are united to each other, and with the intestinal pouch, by a transparent firm substance (a hardened secretion); the eggs contain oily drops of a copper-red colour. The ovaries are situated between the abdominal wall of the body and the intestine, in the form of two pouches, which are divided into departments by transverse walls, and, when swollen with eggs, fill out the whole body. Somewhat behind the middle of the body, a short narrow canal projects from each ovary, and opens into the intestine. Before these openings two others are found, which lead to two warty elevations of the alimentary pouch, probably organs of attachment for the eggs. No nervous system was discovered.

CESTOIDEA.

MAYER has discovered, outside the thin intestine of a *Testudo mydas*, a great number of small greyish-white knots, of $\frac{3}{4}$ of a line in diameter, (Müll. Arch. a. a. O. p. 213. They consisted of a husk, lying under the peritonæum, with cheesy contents, between which a clear oval little bladder, of $\frac{3}{4}$ ''' in size, with an *Entozoon*, was concealed. This latter had an oval form, and was stronger at the one end, at the other more slight and bent inwards. The animal was composed of an external layer of balls and bladders, and an internal finely granulated layer, in which four cord-formed sheaths lay close beside each other. These contained four probosces, sown over with unequal teeth, which, on the lively

motions of the animal, were bulged out and in. He proposes to call this worm *Tetrarhynchus cysticus*, or *Echinococcus corollatus*. It is at all events a young *Tetrarhynchus*, and on this account need not have been arranged in a different genus; the specific name selected by Mayer should have been fitting, for many *Tetrarhynchi* are found encysted.

Steenstrup doubts (Op. ant. cit. p. 113) if a *Tetrarhynchus*, according to Miescher's account (v. Arch. 1841, ii. p. 301) can proceed from a metamorphosis of the *Filaria piscium*, as the tubular and club-shaped coverings which harbour a *Tetrarhynchus*, and which he has often found in *Esox belone*, though they certainly on the surface resemble a *Filaria*, yet have nothing common in structure with that worm.

Duvernoy has mentioned, under the name of *Bothrimonus sturionis*, a new parasite, belonging to the *Cestoidea*, which was found by Lesueur in the intestinal canal of the *Acipenser oxyrhynchus*, Mitch. (Ann. des Sc. Nat. t. 18, p. 123, and Froriep's Neue Notiz. Bd. 24, p. 134). It makes a transition from *Ligula* to *Bothridium*. There is no membering of the body, on the middle of which a furrow runs down both surfaces; in these two furrows are situated a multitude of small elevations, provided with an opening; sometimes, instead of one elevation, there is an oblong cirrus-like papilla, and close behind it a second opening. These parts, which Duvernoy only properly recognised upon one (the abdominal) surface, are perhaps nothing but sexual pores, and Creplin was right, when he declared the presence of such pores on the dorsum of the animal an illusion (Fror. Neue Notiz. Bd. 24, p. 136). The globular head is furnished with two acetabula, standing close together, or rather soldered to each other, which Duvernoy saw situated on the dorsal side of the head of the worm; the posterior end was bluntly rounded or crenated outwardly; this last probably only occurred from an injury.

A comparison has been made by Creplin (Arch. 1842, i. p. 315) between *Tania expansa* and *denticulata*, and attention particularly directed to the latter, with which the former has been often confounded, as both at the same time inhabit the intestine of bullocks.

CYSTICA.

In the treatise of Steenstrup, already so often mentioned, he enumerates also the encysted worms as animals, which perhaps are generating matrices, of which, as yet, the complete animals are not known (Op. ant. cit. p. 111).

R. Froriep, in a treatise entitled "*Hydatides ossium*," has communicated a case of the presence of the *Cysticercus cellulosæ* in the first phalanx of the middle finger of a man (Fror. Chirurg. Kupfertaf. Hft. 87, 1842), and also two cases of hydatids in human bones; from which he

concludes, that three species of hydatids are present in the bones, viz.,—1. Simple serous cysts; 2. Acephalocysts, or *Echinococci*, that is, independent watery bladders, enclosed in a fibrous covering, which are sometimes present in great numbers in one and the same husk; and 3. *Cysticercus cellulosæ*. The author has had the kindness to send to the reporter a preparation from the under extremity of a case, in which knotty hydatids were very extensively present, but in which the reporter has only recognised serous cysts.

Leuckart found, in the peritonæal parts belonging to the uterus of *Lepus cuniculus domesticus*, ten individuals of a *Cysticercus* (Zool. Bruchst. iii. p. 1), which he looked upon as new, and has named *Cyst. elongatus*, with the following diagnosis:—Capite sub-tetragono; collo nullo; corpore rugoso, elongato, depresso; vesica caudali gracili, elongata, apice acuminata, corpore parum longiore. From a notice communicated to the author by Dicsing, a *Cysticercus*, found by Natterer in the *Lepus brasiliensis*, must agree with this *Cyst. elongatus*. A *Cysticercus cercopithecii cynomolgi*, which Leuckart found in a cyst of the liver, and mentions as a doubtful species, is near *Cysticercus tenuicollis*. Leuckart could not discover the circle of recurved hooks in a *Cysticercus pisiformis* from the liver of a house-mouse; and conjectures, that the hooks, as in the *Tænia*, had here fallen off from old age. It has been announced by Engel, that in an epileptic patient, *Cysticerci* were found in considerable numbers in grooved deepenings of the convolutions of the brain, and the muscles of the same patient were also beset with them (Schmidt's Jahrg. 1842, Bd. 53, p. 43). Radius observed a *Cysticercus* in a hydatid of the size of a walnut, in the liver of an old woman, which was surrounded by a cartilaginous capsule (ibid. Bd. 34, p. 269).

Cases of convulsions, madness of swine occasioned by measles, have been related by Rehrs (Gurlt and Hertwig's Magaz. 1842, p. 226). The encysted worms, in such swine, occupied almost more space in the cavity of the skull than the substance of the brain.

A view often taken of the origin of the *Cænurus cerebialis*, as the consequence of preceding inflammation of the brain, has again been brought forward by Dominik (ibid. p. 83).

According to Rocitansky's observations, acephalocysts are very rare in human bones (Handb. der pathol. Anat. Bd. 11, p. 207). They have been found in the humerus, tibia, iliac bones, and the diploe of the skull, generally in consequence of wounds. Rocitansky has communicated the following case:—A day-labourer, forty-two years of age, had in youth, suffered from swellings of the glands of the throat and shoulder, and was afterwards severely affected by syphilis. Four years thereafter, a disease of the bones supervened, with gnawing and penetrating pains, and in the course of a year he died. The left ilium was changed into a fibrous sac, which was filled with acephalocysts (*Echinococcus*-bladders)

the size of millet-seed and nuts, together with numerous small and larger pieces of bone sticking to the inner wall of the sac; small sacs of the same kind were situated on the pubis, ischium, and coccyx. The bladders were partly free and partly united, particularly the small ones, or several were together in the dilated pores or cells of the bare and much shattered bone; the head of the thigh-bone projected into an acephalocystous sac, occupying the place of the socket, which was completely eroded. This case has also been related by Robert (Oppenheim's Zeitschr. f. die Gesam. Mediz. Bd. 20, p. 92).

Reginald James mentions the case of a man, fifty-nine years old, in whom the lateral section of the bladder was made for a retention of urine (Lond. Med. Gaz. Oct. 1842, p. 151). A considerable quantity of urine escaped, without reducing the swelling of the pubis or the pain of the patient. After death, a swelling was found behind and above the bladder, filled with hydatids of different size, and which had pressed it so close to the pubis, that it was divided into an upper and under portion, the latter of which only had been opened in the operation. Another case of *Echinococcus hominis* has been communicated by Koch (Rothsch. allgem. Zeit. f. Chirurg. 1842, No. 17).

Schüödtte has found an intestinal worm in the stomach of *Opatrum sabulosum* of half a line long, which seems allied to the *Caryophyllæus*, and resembles the figure of a parasite, given by Leon Dufour, in the Ann. d. Sc. Nat. 1826, pl. 21, bis, fig. a.-d. (Kröyer, Naturh. Tidsskr. Bd. 4, p. 208). That animal, therefore, certainly does not belong to *Caryophyllæus*, but to the enigmatical form of the *Gregarina*, which are probably subject to a transmutable generation.

HELMINTHES GENERIS DUBII.

OERSTED mentions a sagittal-shaped *Helminthis*, which he found in the intestinal canal of *Lumbriconais marina*, Oerst. (Kröyer, Naturh. Tidsskr. Bd. 4, p. 133). Although a figure is given of the animal, yet the reporter does not know what to make of it. Nor can he make any thing of another enigmatical parasite, which Kröyer discovered on the abdomen of *Hippolyte pusiola* (Monografisk Fremdstilling af Slægten Hippolytes nordiske Arter med Bidrag til Dekapodernes Udviklingshistorie. Kjöbenhavn, 1842, p. 56). The structure is very simple, and points out its position between the *Lernææ*, *Hirudines*, and *Helminthes*.

Philippi asserts, that the *Physophora* harbours in its stomach, worms which as yet have not been clearly defined (Fror. N. Notiz. Bd. 23, p. 88, and Bd. 22, p. 344).

A vermicular disease of poultry has been mentioned by Delafond, without exactly describing the worms (Gurlt und Hertwig's Mag. ant. cit. p. 115).

Miescher has been struck by a remarkable striped appearance of the muscles of the trunk, extremities, throat, and face, and of those of the eye, and also of the diaphragm, in a house-mouse (Ber. über die Verh. der naturf. Ges. in Basel vom Aug. 1840 bis Juli 1842, Bas. 1843, p. 193). The muscles of the tongue, larynx, pharynx, and all the involuntary muscles, were normal. The stripes were like milk-white threads, which were found both on the upper surface as well as in the interior of the muscles, and always ran parallel with the fibres; the length of each thread corresponded to the length of the muscle; each individual thread represented a cylindrical pouch, becoming narrow at both ends, and was filled with granular contents, in external appearance resembling a *Filaria*. The walls of the pouches were composed of a simple structureless membrane; the contained grains had an oblong, reniform, or spherical shape, and a length of 0.0034''' to 0.0054'''. They did not resemble simple cells, but consisted of a simple membrane, which enclosed a very finely granulated substance. Miescher is undecided as to their use; they might either constitute a peculiar diseased condition of an individual muscular fibre, as each pouch may have been engendered under the cover of the muscular bundle instead of the fibrillæ, or they were peculiar parasitical formations, which here chose their habitation, and have pressed out from the actual muscular substance. Neither is Miescher determined whether the parasite be of a vegetable or animal nature; but it puts us in mind of the pouches, observed by Bowmann (Arch. 1841, ii. p. 296), in the muscles of an eel, which were filled with *Trichina spiralis*.

Gluge has discovered an *Entozoon* in the blood of the heart of a frog (Müll. Arch. 1842, p. 148); it was very transparent and elongated, having a head and tail running to a point, and, on the right side, three oblong processes bulged out and in. It did not contain little balls in its interior, like the *Hæmatozoon* described by Valentin (v. Müll. Arch. 1841, p. 435), but was probably a creature allied to it. *Hæmatozoa* have also been observed by Remak in the blood of most river fish, and almost constantly in the pike (Cannstatt's Jahresb. 1842; Bericht über die Leistungen im Gebiete der Physiol. im Jahre, 1841, p. 10.) They were of different sizes, but all generally twice as large as the blood-corpuscles. When in repose, they had an oval or pear-shaped form, and they pushed out dentated processes. These processes are the consequence of the undulating motions of the transparent membranous part of the body. Nearer one end, and more laterally, Remak distinguished a thicker oblong untransparent nucleus, from which, usually, foldings of the membranous part radiated out to all sides. This membranous portion in it ran out into two short tips at the end nearer the solid kernel; in the *Hæmatozoa* of the stickleback, it ran out to a hook-shaped crooked thin thread.

PSEUDO-HELMINTHES.

MAYER has given his views on the nature of the *Spermatozoa*, and is still convinced that they are actually animals, as their peculiar form and organization, as well as their voluntary movements, correspond to the animal character (Neue Untersuch. p. 9).

Krohn has shown that the *Vertumnus thetidicola*, Otto, which, for a long while, has been held as a *Trematoda*-like parasite, is not an independent animal; but that it is constituted from forms which are only appendages of the *Thetys*, but have certainly a frail connection with it (Müll. Arch. 1842, p. 418). The reporter perceives, from the Transactions of the Meeting of Naturalists at Turin, that already, in 1840, Verani had questioned whether these appendices of the *Thetys* were pseudo-parasites (Isis, 1842, p. 252), and that Nardo had remarked, that the *Thetys* was able to reproduce them when torn off. It follows, therefore, that the remark of Maeri, made many years ago, who had correctly understood the meaning of these appendices, must be again added to the description of *Thetys leporina*, viz.:—*Majores appendices sunt membranaceæ, ovato-oblongæ, acutæ, deciduæ* (Atti della reale academia della Scienze di Napoli. Vol. ii. 1778, p. 170, tab. 4.) Krohn has distinctly perceived the skin of the *Thetys* to pass over, without interruption, the parts which have been named *Vertumni*; and that the same colour which the *Thetys* itself has, is found again on the appendices. The observations of the reporter agree completely, in the latter respect, with Krohn's assertions. He may add also, that one sees, on the first glance, that the groove found at the anterior thick end of the body of the *Vertumni*, and regarded as the animal's mouth, cannot be an acetabulum, as it is neither covered by an epidermis nor an epithelium; and as no where, in this groove, is the peculiar structure of an acetabulum to be distinguished. The wide canal, which stretches from the groove longitudinally, in the body of the *Vertumnus*, is connected with an innumerable multitude of larger and smaller sinuses, which lie buried in the other parts of the animal. The whole parenchyma consists of irregular cells, with wide meshes, which can be blown up through the opening in the groove of the *Vertumnus*, like the parenchyma of the lungs of an *Amphibium*.

R E P O R T

ON THE

WORKS WHICH HAVE APPEARED DURING
THE YEARS 1841 AND 1842,

ON THE

ECHINODERMATA, ACALEPHA, POLYPI, AND INFUSORIA.

BY

PROFESSOR C. TH. V. SIEBOLD.

ECHINODERMATA.

ZOOLOGISTS and Physiologists have, last year, directed much of their attention to the *Echinodermata* (upon which there has been no report in these Archives since 1838), so that this class promises to be more completely described than any other of the invertebrata.

Agassiz has principally distinguished himself in this department, as for several years he has been zealously publishing "Monographies d'Echinodermes vivans et Fossiles," of which four admirable livraisons are now before the reporter. He has also already treated of this class in his "Nomenclator Zoologicus, Fasc. 1. Soloduri, 1842."

Sharpey has published an ample treatise on the internal structure of the *Echinodermata* (Cyclop. of Anat. and Physiol. vol. ii. 1839, p. 30); and Dujardin has also laboured at this class, in the third volume of Lamarck's Natural History.

Forbes has published an excellent work on the British *Echinodermata*, which is illustrated, in a truly luxurious manner, with beautiful woodcuts (A History of British Starfishes, and other Animals, of the Class Echinodermata. London, 1841). This is a proof, that in England, the interest for Zoology must be more extensive than in Germany. Of late years a number of beautifully illustrated monographs on the British

Fauna have appeared; while, in Germany, works of the same description can hardly be provided with the most necessary figures.

Forbes divides the *Echinodermata*, according to their organs of motion, into six orders, which correspond with the divisions hitherto in use.—

1. PINNIGRADA (*Crinoideæ*): of these *Comatula rosacea*, L. (*mediterranea*, Lam.), only is a native of the English coast. *Pentacrinus europæus*, Thoms., is nothing but a young *Comatula*.—2. SPINIGRADA (*Ophiuridæ*). Forbes enumerates the following: *Ophiura texturata*, Lam.; *albida*, Forb., which has been declared by Müller and Troschel to be *Ophiopsis ciliata*; *Ophiocoma neglecta*, Johnst. (*Ophiopsis squamata*, Müll. and Tr.); *Ballii*, Thoms.; *punctata*, Forb.; *filiformis*, Müll.; *brachiata*, Montag.; *granulata*, Link; *bellis*, Flem.; *Goodsiri*, Forb. (according to Müller and Troschel, perhaps identical with *Oph. Ballii*); *rosula*, Link; *minuta*, Forb.; the last two species have been referred by Müller and Troschel to *Ophiothrix fragilis*; *Astrophyton scutum*, Forb., which is perhaps *Astroph. Linkii*, Müll. and Tr.—3. CIRRHIGRADA (*Asteriadæ*): *Uraster glacialis*, Agass.; *rubens*, Ag.; *violacea*, Müll.; *hispida*, Penn.; *Cribella oculata*, Penn.; *rosea*, Müll.; *Solaster papposus*, L.; *endeca*, L.; *Palmipes membranaceus*, Retz.; *Asterina gibbosa*, Penn.; *Goniaster Templetoni*, Thomp.; *equestris*, Gm. (*Astrogonium phrygianum*, Müll. and Tr.); *Asterias aurantiaca*, L.; *Luidia fragilissima*, Forb.—4. CIRRHISPINIGRADA (*Echinidæ*): *Cidaris papillata*, Lesk.; *Echinus miliaris*, Lesk.; *sphæra*, Müll.; *Flemingii*, Ball; *lividus*, Lam.; *neglectus*, Lam.; *Echinocyamus pusillus*, Müll.; *Echinorachinus placentæ*, Gm.; *Spatangus purpureus*, Müll.; *Brissus lyriifer*, Forb.; *Amphidotus cordatus*, Penn.; *roseus*, Forb.—5. CIRRHIVERMIGRADA (*Holothuriadæ*): *Psolus phantapus*, L.; *Psolinus brevis*, Forb. and Goods.; *Cacumaria frondosa*, Grun.; *pentactes*, Müll.; *communis*, Forb. and Goods.; *fusiformis*, Forb. and Goods.; *hyalina*, Forb.; *Drummondii*, Thoms.; *Hyndmani*, Thomp.; *fucicola*, F. and G.; *Ocnus brunneus*, Forb.; *lacteus*, F. and G.; *Thyone papillosa*, Müll.; *Portlockii*, Forb.; *Chirodota digitata*, Montagu.—6. VERMIGRADA (*Sipunculidæ*): *Syrinx nudus*, L.; *papillosus*, Thoms.; *Harveii*, Forb.; *Sipunculus bernhardus*, Forb.; *Johnstoni*, Forb.; *Priapulius caudatus*, Lam.; *Thalassema Neptuni*, Gaertn.; *Echiurus vulgaris*, Sav.

A. Hill Hassall has offered a contribution to the Marine Fauna of Ireland (Ann. Nat. Hist. ix. p. 132). He has enumerated *Comatula rosacea*, with ten species of *Asteriadæ*, *Spatangus purpureus*, *Echinus sphæra*, *Amphidotus cordatus*, and *Echinocyamus pusillus*, as present in the Bay of Dublin.

We are indebted to Grube for a very valuable contribution to the distribution of the *Echinodermata*, in the Adriatic and Mediterranean Seas (Actinien, Echinodermen, und Würmer des Adriatischen und Mittel-Meeres. 1840, p. 14). The following *Crinoideæ*, *Ophiuridæ*, and

Asteriadae have been discovered by him:—*Comatula mediterranea*, Lam.; *Gorgonocephalus verrucosus*, Lam.; *Ophiura lacertosa*, Lam.; *pentagona*, Lam.; *squammata*, Lam. (*Ophiolepis Ballii*, from Müller and Troschel's account); *moniliformis*, Grub. (*Ophiolepis squammata* of Müll. and Tr.); *cordifera*, Delle Chiaje; *scutellum*, Grub. (*Ophiohyx scutellum*, Müll. and Trosch.); *rosularia*, Grub. (*Ophiacantha setosa*, Müll. and Trosch.); *fragilis*, Müll.; *Asterias coriacea*, Grub. (*Ophiaster attenuatus*, Gray, according to Müll. and Trosch.); *subulata*, Lam.; *seposita*, Lam.; *glacialis*, Lam.; *aurantiaca*, L.; *bispinosa*, Ott.; *platyacantha*, Phil.; *pentacanthæ*, Delle Chiaje; *membranacea*, Retz. Of *Echinidae* Grube has found the following:—*Spatangus flavescens*, Müll.; *atropos* and *carinatus*, Lam.; *Echinus saxatilis*, L.; *neapolitanus*, Delle Chiaje; *esculentus*, L.; *miliarius* and *neglectus*, Lam. Of *Holothuriadae* the following:—*Holothuria regalis*, Cuv.; *Sanctori*, Delle Ch.; *tubulosa*, Müll.; *Stichopus cinerascens*, Br.; *Sporadipus impatiens*, Forak.; *Stellati*, Delle Ch.; *maculatus*, Br.; *Cladodactyla doliolum*, Pall.; *Dicquemarii*, Cuv., with several species which he holds as new, viz.—*Holothuria mammata*, *catanensis*, *Sporadipus glaber*, *Psolus granulatus*, *Cladodactyla syracusana*, *Chiridota Chiaii*, and *pinnata*. Grube has, at the same time, characterized two new genera. The one, *Phyllophorus*, is intermediate between the genera *Sporadipus* and *Cladodactyla* of Brandt. There is a single species taken at Palermo, *Phyl. urna*. The feet of this animal are scattered over the whole body, and are not arranged in rows, and its tentacles are branched and arboreous, and not in the form of a shield. The other genus, called by Grube *Hoplodactylus*, is allied to *Liosoma*, Br., but has the tentacles not shield-shaped, but simply cylindrical, and is only represented by one species, *Hopl. mediterranea*. Besides the *Sipunculus nudus*, L., and *verrucosus*, Cuv., Grube discovered the genus defined by him *Anoplosomatium*, which forms a transition from the *Echinodermata* to the worms, having a simple cylindrical body, neither furnished with tentacles, teeth, nor warts, nor with bristles or short pedicles to the feet; but each end of the body is perforated by an opening. The only species, named by Grube *Anopl. utriculus*, was got at Palermo, and is unarticulated throughout, and of a pale flesh colour.

The nervous system of the *Sipunculus nudus*, the knotless abdominal cord of which, from its position, puts us in mind of the nervous system of the *Annulata* and of the *Holothuria tubulosa*, has been described by Krohn. (Müll. Arch., 1839, p. 348; and 1841, p. 9.)

Some observations on the remarkable power of reproduction of the *Holothurice* have been communicated by Dalyell. (Froriep's Neue Notiz., 1840, p. 1.)

A new *Synapta* has been found in the British Channel by Quatrefages, and described as *Syn. duvenœa* with the following diagnosis:—

(l'Institut., 1841, p. 398.; Ann. d. Sc. Nat. t. 17, 1842, p. 22; and Fror. N. Notiz. Bd. 21, 1842, p. 165.):—Corpore molli, vermiformi, hic et illic modo turgido, modo constricto et transversim plicato; cuti roseola, hyalina, adherente; vittis quinque fibrosis, opacis, albis, longitudinalibus instructa: ore plana, duodecim tentaculis pinnatifidis circumdato; ano rotundo, nudo, terminali. This animal prefers the sea-slime, and feeds on the sand, with which its whole intestine is stuffed. It very quickly separates the hinder part of its long vermiform body, either voluntarily or on touching it; the fragments of the animal thus thrown off move about for three or four days. The animal itself changes its position by vermiform windings of its body, making use of its tentacles for that purpose, which are in constant motion, and are at the same time employed as grasping-organs. Although this *Synapta* shows sensibility to a very strong admission of light, yet it does not appear to possess any definite organ of sight; it has also no perception of sound. Its cuticular covering is composed of a tender epidermis and a corium, which is slightly rose-coloured, by a transparent granulated substance. The upper surface of the body is not smooth, but covered by a number of oval elevations like raspberries; these bear remarkable anchor-shaped angular hooks, which are toothed on the convex side of their two barbs, and have a small arched dentated dilatation at the upper end of the stalk opposite the barbs. The barbs or anchor-shaped bodies, which are about the length of $\frac{1}{10}$ mill., are fastened by the upper dentated end of the stalk, in an oblique direction, to a small perforated shield. These parts, the anchor and shield, become dissolved with effervescence in acids, while they are not affected by caustic potass. The other elevations which do not bear anchors are covered with small spherical and oval bodies, some of which are striped transversely. These bodies can protrude from their interior a filiform body of $\frac{3}{10}$ mill. in length; they are not affected by acids, but are dissolved by kali causticum. Quatrefages compares these little bodies with the nettle organs of the *Actinia*, and believes that the anchors do not exclusively, as Eschscholtz supposes, cause the bur-like appendages and the urtication of the *Synapta*, but that the last described bodies, principally as in the *Actinia*, work as stinging organs. The anus is opposite the mouth, at the end of the hinder part of the body. The five feathered tentacles surrounding the mouth, have a tenderer cuticular covering than the rest of the body, and bear neither anchor nor shield, nor stinging organ, but are furnished with two rows of acetabula on their inner surface, which are very useful for taking the food and in creeping forward. The tentacles, in which the circulation of the blood is maintained in a lively manner by the vibratile epithelium, also probably serve as organs of respiration; but at the same time a contrivance by which the *Synapta* can constantly take up water into the cavity of the body, and again

throw it out by contraction, must also contribute to the process of respiration. There are found, namely, between the roots of every two tentacles, on a small papilla-shaped elevation, sometimes four, sometimes five openings, from which canals pass in through the covering of the body to the cavity, giving entrance and exit to the water. With respect to the organs of propagation, Quatrefages has discovered the *Synapta duvernœa* to be hermaphrodite. He could not discover any nervous system.

Agassiz has turned his attention to the *Echinidæ*, in his monographs above mentioned.

The first livraison of this work embraces the genus *Salenia* (Monographies Echinodermes, 1re livrais. contenant les Salenies. Neuchatel, 1838), which, containing only fossil species, we shall not analyze here. The second contains the *Scutellæ* (1841.) Agassiz arranges these *Echinodermata* in that division of the *Echinidæ* which he has called *Clypeastroides*, and which have, as a chief characteristic, a central mouth and a sub-central anal opening. Agassiz holds it unsuitable to unite the *Scutellæ* into one genus as later Naturalists have done; and he was constrained, as he took into consideration the internal organization, partly again to re-establish older genera, and partly to add new, by which means he makes thirteen genera, in which the position of the anal and sexual openings, the figure which the ambulacra form, the structure of the organs of mastication, and the cavity of the body, furnish the principal points for their characters.

The shell of the *Scutellæ*, like that of the *Echinidæ*, is composed of ten regions of plates, of which five rows bear ambulacra, and the five without them lie between; each region is formed, properly, of a double row of plates, which are so intimately united to each other, that they can hardly be separated. Round the mouth, instead of twenty plates, there are usually only ten or five to be counted, which form the buccal rosettes so called; the spiniferous *Scutellæ* rest upon the tuberoles on which the spines are situated, as in *Echinus*. Of these tubercles the larger may be distinguished as spiniferous tubercles, and the smaller as miliary. The ambulacra, which form a five radiated rosette on the dorsum of the *Scutellæ*, are as yet very little known. Agassiz was able to observe, on a very well preserved, although dried specimen of *Laganum rostratum*, that a row of lamellæ was situated on the inner side of the ambulacral pores, which evidently stood in connection with them. From this it is to be concluded, that in the *Scutellæ* the same organization of the ambulacra occurs as in the *Echini*, and that these lamellæ indicate the dried branchial sacs. The *Scutellæ* are very remarkably and peculiarly distinguished by the ray-like furrows going out from the centre and ramifying on the under surface of the shell; in these furrows are also found a number of pores, which, like the pores of

the dorsum, stand in connection with ambulacra. The opening of the mouth lies opposite the small apical rosette, which is composed of three different parts, namely, the madreporiform plate, the plates containing the sexual openings, and those which bear the ocelli. These different plates are also so intimately connected to each other, that they can with difficulty be separated. The spines vary in form according to the genera and species; those of the upper surface are mostly clavate, those of the under straight and pointed; several species of *Mellita* and *Encope* have a third sort of spines, which are flattened laterally at the ends. These spines, which are organized, as in *Echinus*, can be moved by the living animal on all sides. The greater number of the *Scutellæ* are grey or violet coloured. In those in which the margin of the shield is entire, the anus appears farther from the mouth than in those the margin of which is incised. The cavity in the interior of the shield is divided by many perpendicular partitions. The organs of mastication of the *Scutellæ* are constructed much on the plan of the teeth of *Echinus*. The intestinal canal, which winds through the cavity of the body, contains, generally, fragments of small corals and shell-fish.

Agassiz divides the *Scutellæ* into thirteen genera, which are all figured. The four genera, *Runa*, *Amphiope*, *Scutella*, and *Scutellina*, containing only antediluvian forms, are here omitted. Of the genus *Rotula*, two species are described: *R. Rumphii* (*Scut. dentata*, Lam.) and *Augusti* (*Scut. octodactyla*, Lam.) To the three already known species, *Mellita quinquefora*, Ag., Lam., *testudinata*, Kl., *hexapora*, Ag., L., Gm., Agassiz has added two new species: *M. similis*, disco suborbiculari vel subquinguangulari, lunulis sex, basi undulata, sulcis ambulacralibus valde ramosis; and *M. lobata*, disco suborbiculari, lunulis sex, lunulis ambulacralibus posticis apertis, petalis brevibus, ovatis, subclausis, poris genitalibus ocellaribusque vere distinctis. The genus *Encope* is represented by eleven species, of which nine are new, viz.,—*E. (Scutella) emarginata*, Ag., Lam.; *tetrapora*, Ag., Blainv.; *micropora*, *perspectiva*, *cyclopore*, *oblonga*, *subclausa*, *Valenciennesii*, *Michelini*, *grandis*, and *Stokesii*, Ag. To the genus *Lophophora*, four species are reckoned: *L. (Scutella) bifora*, Ag., Lam.; *truncata*, Ag. (*Scutella bifora*, var. 2, Lam.); *bifissa*, Ag., Lam.; *aurita*, Ag., Blainv. (*Scutella bifissa*, var. 2, Lam.) Besides *Amphiope bioculata*, Ag. (*Scutella bifora*, var. 3, Lam.), Agassiz describes a second species: *A. perspicillata*; disco valde depresso, postice subrostrato, lunulis subcircularibus, petalis subovatis, acutis.—Of *Echinarachnius* there are three species described, *E. parma*, Gray, *Rumphii*, Ag., Blainv., and *atlanticus*, Gray; and of *Arachnoides* only one, *A. placenta*, Ag., Lam. The genus *Laganum* has twelve species, of which nine are described for the first time: *Laganum Bonani*, Ag., Kl., (*Clypeaster laganum*, Lam.); *depressum*, *decagonum*, Lesson and Ag.;

ellipticum, *elongatum*, *rostratum*, *marginale*, *stellatum*, Ag.; *tonganense*, Quoy and Gaim.; *Lesueurii*, Val.; *orbiculare*, Ag., L., Gm.; *Peronii*, Ag. (*Scutella orbicularis*, Lam.) Of the genus *Echinocyamus*, only two living species are described; *E. pusillus*, Flem., and *angulosus*, Leske. *Moulinia* is the thirteenth and last genus, embracing the single species, *M. cassidulina*.

After the third livraison of Agassiz's Monographies, which treated only of antediluvian *Echinidæ* (1842), a very comprehensive monograph appeared by Valentin, on the anatomy of the genus *Echinus* (Monographies d'Echinodermes 4 e. livraison, contenant l'Anatomie du genre *Echinus*, par G. Valentin, 1842). He distinguishes in the shell of the *Echinus* three kinds of calcareous plates: the largest form the principal mass of the shell, the two others comprehend the smaller buccal and anal plates. The anal plates are held together by a contractile membrane. All the plates, with the exception of the buccal, bear spines, which are fixed by their articulating heads in a muscular layer. The suckers of the ambulacra are extraordinarily contractile, and can be projected, by the living *Echinus*, far beyond the longest spines, in order to touch with them or to move forwards; each sucker is furnished at its free end with an acetabulum. Besides these long pedicelled acetabula, the *Echini* possess other stalked appendages, which are very abundant round the mouth, and were formerly supposed to be parasitic animals and young brood of the *Echinus*. Valentin divides them into three kinds according to their shapes, and calls them pedicellaires gemmiformes, tridactyles, and ophiocephales. He has also very exactly described the *Laterni* of Aristotle; and the vascular system has been subjected to a careful investigation.

As supplementary to this excellent monograph, the works which appeared almost simultaneously on *Echinus*, by Erdl, Krohn, and Kölliker, are to be mentioned.

Erdl's researches have been particularly directed to the spines, acetabula, and pedicelli of the mouth, as well as to the external branchiæ of the *Echinus saxatilis* (Arch. 1842, i. p. 48). Krohn's communications are confined to the description of the nervous system of the *Echinus* and *Spatangus* (Müll. Arch. 1841, p. 2, and Ann. d. Sc. Nat. t. 16, p. 288). The separate sexual organs have been recognised by Kölliker in *Echinus saxatilis* (Beiträge zur Kenntniss der Geschlechtsverhältnisse und der Samenflüssigkeit wirbelloser Thiere, Berlin, 1841, p. 39). Agreeably to what had formerly been pointed out on these parts in the *Echini* by Peters (Müll. Arch. 1840, p. 143, Fror. N. Notiz. No. 275, p. 168, and Ann. d. Sc. Nat. t. 13, 1840, p. 196), Milne Edwards and Lallemand (Ann. d. Sc. Nat. t. 13, 1840, p. 376, and Fror. N. Notiz. No. 300, p. 218); and by Valentin (Repertor. f. Anat. und Physiol. 1840, p. 301) in *Spatangus*.

The *Asteriadae* have, last year especially, found many zoological labourers. Besides the already mentioned contributions of Forbes and Grube, various others remain to be mentioned, viz.,—Forbes on the *Asteriadae* of the Irish Sea, in *Memoirs of the Wernerian Society*, 1839, t. viii. 1, p. 114; Agassiz *Notice sur quelques points de l'Organisation des Euryales, accompagné de la description détaillée de l'espèce de la Méditerranée*; *Memoires de la Société des Sciences Naturelles de Neuchâtel*, 1839, vol. ii.; Thompson, *Ann. Nat. Hist.* vol. v. 1840; and Gray, *ibid.* vol. vi. 1840. The reporter, however, refrains from analyzing these, as in the admirable work on the *Asteriadae*, lately published by Müller and Troschel, the appearance of which must have been most anxiously expected from the cursory remarks (*Archiv.* 1840) already published by these Naturalists for two years past, all the matter belonging to this class has been as completely elaborated as can be desired (*System der Asteriden.* 1842). The descriptions of the *Asteriadae* are so excellently given in this work, and the genera and the species so accurately defined, that it has afforded the reporter a real pleasure to arrange, with this book in his hand, the collection of *Asteriadae* belonging to the zoological cabinet at Erlangen. The plates, which represent only individual portions of these *Echinodermata*, are distinct, and serve to show, where description is insufficient, the highly complicated arrangement of the different parts of the cuticular covering, viz.,—the spines, plates, granules, tubercles, pedicellaria, &c. These plates accomplish their aim completely by their extraordinary exactness, which is a great advantage, as one often takes up such monographs, richly furnished with illustrations, in order to define, by their means, zoological objects, and yet, by the diffuse descriptions, and dazzlingly coloured plates, can only make out few species with certainty.

Müller and Troschel have prefixed an introduction to the systematic descriptive part of the monograph of the *Asteriadae*, in which their orders are characterized. They are defined, generally, as those *Echinodermata* which have a star-shaped or polygonal, mostly pentagonal form, and, besides the cuticular skeleton, have also an internal one. They are divided into two divisions, *Asteriadae* and *Ophiuridae*; the former have furrows on the abdominal side, and a corporeal cavity stretching from the disc to the arms or processes, which contains the viscera. In the *Ophiuridae*, with their two sub-divisions, *Ophiuræ* and *Euryalæ*, the abdominal furrows are wanting, and the viscera are confined to the cavity of the disc. In the family of the *Asteriadae*, there is frequently an anus on the dorsal side of the disc, in several genera central, but mostly sub-central. In this introduction, a view of the different divisions has been given, as they have hitherto been characterized by authors. In the general description of the first family of *Asteriadae*, both Naturalists have drawn attention to the pedicellariæ, which, as small nipper-like two to three-

armed organs are present on all parts of the upper surface of the body. They can open and shut their arms, and resemble in some measure the pedicellariæ of the sea-urchin: they are divided into two sorts, the pedicellariæ forcipatæ, with thin pointed arms, and pedicellariæ valvulatæ, with broad flap-like arms. The former are sometimes pedicled, sometimes sessile; the latter are always sessile.

The *Asteriæ* are divided into three families; the first comprehends those star-fishes which have four rows of tentacles in each abdominal furrow, and an anus; to this belongs the single genus, *Asteracanthion*, with fourteen species, among which are three new, *A. africanus*, *polaris*, and *bootes*. The second embraces those genera which have only two rows of tentacles in the furrows and an anus; it contains fourteen, viz.,—*Echinaster*, with eleven species, of which *E. crassus*, *gracilis*, *Eschrichtii*, Müll. and Trosch., *eridanella*, and *serpentarius*, Val., were previously undescribed: *Solaster*, Forb., with two species: *Chataster*, with three species, among which are the two new species, *Ch. Hermannii*, M. and T., and *Troscheli*, Val.: *Ophidiaster*, Ag., with twelve species, among which, *O. Hemprichii*, *diplax*, *Ehrenbergii*, *tuberculatus*, *echinulatus*, M. and T., and *Ornithopus*, Val., are new: *Scytaster*, with six species, among which, *S. zodiacalis*, *semiregularis*, and *Kuhlii*, are new: *Culcita*, with four species, of which, *C. novæ-guinææ*, and *grex*, are also new: *Asteriscus*, with fifteen species, among which, *A. pectenifer*, *Diesingi*, M. and T., *cephæus* and *setaceus*, Val., are new: *Pteraster*, with one species: *Oreaster*, with seventeen species, among which, *O. affinis*, *chinensis*, *tuberculatus*, *verrucosus*, *carinatus*, *orientalis*, M. and T., and *regulus*, Val., are new: *Astrogonium*, with ten species, which contain *A. magnificum*, *astrologorum*, *ornatum*, *Lamarckii*, M. and T., and *geometricum*, as new: *Gonidiscus*, with nine species, two of which are new: *G. placenta*, and *capella*, M. and T.: *Stellaster*, with two species: *Asteropsis*, with four species, among which, the only undescribed species is *A. tenuantha*, Val.: and, finally, *Archaster*, with three species. The third family contains those star-fishes, which are furnished with two rows of tentacles on the abdominal furrows and no anus; to this belong only three genera; *Astropecten*, with twenty-five species, of which, *A. brasiliensis*, *Valenciennii*, *Tiedemanni*, *polyacanthus*, *armatus*, *Hemprichii*, *japonicus*, *hispidus*, *longispinus*, *marginatus*, *andromeda*, *granulatus*, M. and T., *scoparius*, *serratus*, and *hystrix*, Val., have been hitherto undescribed: *Ctenodiscus*, with two species: and *Luidia*, with three species, of which *L. maculata*, M. and T., is quite new. The generic characters of all these are chiefly taken from the form of the arms, whether they are long or short, cylindrical or conical; and from the covering of the upper surface of the body, whether covered with plates, spines, processes, granules, tubercles, pedicellariæ, &c.; and after the manner in which the different parts are arranged.

The section of the *Ophiuridæ*, which want the pedicellariæ and the

anus, is divided into two sub-divisions, *Ophiuræ* and *Euryalæ*. The *Ophiuræ* have arms fitted only for walking; their skin is either naked, or covered with hard scaly granules, spines, and plates; on the abdominal side of the disc are found five interbrachial shields between the roots of the arms, in which a larger one is distinguished as the shield of the mouth; a wedge-shaped ossicle projects towards the mouth from each interbrachial shield as a maxilla, from which a tooth-process is also directed towards it. The margins of the five-cleft mouth are either naked or covered with papillæ, which appear either simple or serrated on their margins. The tooth-process bears teeth in all *Ophiuræ*, and in some also papillæ. On the arms two rows of ventral and dorsal, and two of lateral plates, can be distinguished. On the abdominal aspect of the arms, on each side of a ventral shield, there is an opening for the passage of a filiform tentacle. Müller and Troschel divide these *Ophiuræ* into two families, of which the first contains such animals as have four genital clefts in each interbrachial space, and papillæ on the cleft of the mouth. To this belong the two genera, *Ophioderma* and *Ophiocnemis*; the former with three species, of which *O. cinereum* and *Wahlbergii* are new; and the latter with one species. The second family embraces those *Ophiuræ*, which have only two genital-plates in each interbrachial space. The first group of this family are the *Ophiuræ*, which have the mouth-cleft covered with papillæ. The genera which are clothed on the disc and arms with hard parts are first,—*Ophiolepis*, with seventeen species, of which the new are, *O. cincta*, *Sundevalli*, *imbricata*, M. and T.: *Ophiocoma*, with eighteen species, of which *O. erinaceus*, *Wendtii*, *Schoenleinii*, *dentata*, *pica*, *picta*, *arctica*, M. and T., *serpentaria*, Val., *lineolata*, Desjard., are new: *Ophiorachna*, with four species, of which *O. infernalis*, *gorgonia*, and *septemspinosa*, have not hitherto been described: *Ophiacantha*, with two species, of which *O. spinulosa* is new: and *Ophiomastix*, with one species. Next follow the two genera *Ophiomyxa* and *Ophioscolex*, in which the disc and arms are naked. Each genus contains a single species. In the second group are placed the *Ophiuræ* with no papillæ on the clefts of mouth. It comprehends the two genera, *Ophiothrix* and *Ophionyx*, of which the former has eighteen, and the latter four species. The characters of the genera of the *Ophiuræ* are also taken from the spines, granules, scales, and plates of the covering of the body, according to their presence, construction, and arrangement; and, at the same time, the circumference of the mouth, which is covered with spine or tooth-like papillæ, and with simple or crowded papillæ, affords additional distinctions.

In the *Euryalæ*, the second sub-division of the *Ophiuridæ*, the arms are grasping organs, and can be rolled up towards the mouth. They have no lateral spines, like the *Ophiuræ*, but two rows of small papillary crests on the abdominal side of the arms. Müller and Troschel first characterize a new genus, from a species hitherto undescribed, the

Atteronyx Lovéni, which has no branched arms, bears one madre-pore-form plate on the abdominal surface, and is covered with prickle-like papillæ on the margin of the mouth. Next follows the genus *Trichaster*, Agas., with one species, the arms of which branch regularly dichotomously towards the end, the madre-pore-form plate is wanting, and the margins of the mouth are set with cylindrical papillæ. The genus *Astrophyton*, with eight species, is the last; its arms are branched from the base, the margins of the mouth seem set with spine-like papillæ, and there is one madre-pore-form plate. In an appendix to this work, anatomical distinctions of the families and genera of the *Asteriæ*, and various other remarks on the internal structure of these *Echinodermata* are communicated.

Erdl has subjected the tentacles of the *Asteriæ* and *Ophiuræ* to a more exact investigation (Arch. 1842, i. p. 58).

Kröyer (Isis, 1842, p. 932) confirms the opinion of Müller and Troschel (Arch. 1840, i. p. 329), that the small individuals, of two lines in size, of the *Ophionyx armata*, are only the young state of another *Ophiuridæ*, probably of an *Ophiolepis* which he calls *O. aculeata*. This must in its growth gradually lose, from the basis of the arms to the point, the echinulated spines and double hooks which distinguishes the genus *Ophionyx*. Kröyer saw, in a specimen of this *Ophiolepis aculeata*, one-sixth of an inch in size, spines which were smooth, except at the extremest joints of the arms, where some scattered echinulated spines and double hooks were present. He also observed an individual in the act of reproducing a lost arm, which had quite the construction of *Ophionyx armata*. Müller and Troschel, however, have placed *Ophionyx armata* in the family of the *Asteriada*, as an independent species. Kröyer found, besides, in a *Euryale* (*Astrophyton*) *verrucosa*, two young *Euryales* (Isis, 1842, p. 935), the smaller of which was only 9" long, and from the manner of the branching of the arms, it would be considered a *Trichaster*, M. and T.; but the larger one, in this respect, was already much nearer the mother. Kröyer concludes from this, that the different manner in which the arms branch in the *Euryalæ* is not alone sufficient for founding new genera; but Müller and Troschel have taken into consideration other essential characteristics in establishing their genus *Trichaster*.

Sars has made the observation (Müll. Arch. 1842, p. 330), that *Asterias sanguinolenta* and *angulosa*, by a voluntary bending in of the basis of their rays, can form a well-closed cavity, in which the eggs are preserved, and the young harboured for a long while. They hold fast to this cavity by their four clasping organs, and are carried about by the mother.

The separate sexes of the *Asteriæ* and *Ophiuræ* have been pointed out by Kölliker (Beiträge, op. cit. p. 39), and Rathke (Fror. Neue Notiz. No. 269, p. 65).

Müller has undertaken a work on the genera and species of the

Comatulæ (Bericht über die zur Bekanntmachung geeigneten Verhandlungen der Königl. Akad. der Wissensch. zu Berlin, 1841, p. 179, and Arch. 1841, i. p. 139). He distinguishes twenty-four species, among which twelve are found with ten arms, the others are many-armed. Fifteen are new species, nine of them belonging to the many-armed. The *Comatulæ* want a madreporæ-form plate. The sexes are separate. Müller never observed the cirrhi of the central tubercle (cup) move.

He has also published an important contribution to the more exact knowledge of the *Pentacrinus caput Medusæ* (Bericht, ant. cit. 1840, p. 88, and Archiv. 1840, i. p. 307). The stalk as well as the cirrhi of this Crinoid are without muscles, while the stalk of the young *Comatulæ* (*Pentacrinus europæus*, Thomps.) is contractile. The arms and pinnulæ of *Pentacrinus* are furnished with muscles, which are situated on the abdominal side. The alimentary canal passes through the middle of all the parts of the skeleton. The furrows of the tentacles of the *Comatulæ* and *Pentacrini* are internally provided with two rows of very small tentacles. There are genera among the *Crinoidæ* with and without an anus. The arms of the *Comatulæ* and *Pentacrini* have two canals, besides the vascular one, passing through the middle, namely, the abdominal-cavity canal and the tentacle canal; the five canals of the abdominal cavity open into it. The digestive organs lie in the disc under the skin; the sexual parts, on the other hand, are in the pinnulæ under the ventral cuticle. In the *Crinoidæ*, the arm-rays always pass out from the dorsal part of the calix; in the *Asteriadae*, the whorls of the rays pass from the ventral side.

ACALEPHÆ.

AGASSIZ has given a list of the systematic names of the genera of *Acalepha* in the Nomenclator Zoologicus (Fasc. i. 1842); much investigation, has been bestowed on this class during the past year, and the history of their development and metamorphoses proves, that several genera, hitherto recognised as distinct, are merely the young state of others.

Currents have been observed by Patterson in the vessels, passing from the stomach and ribs of the *Cydippe pomiformis* (Trans. of the R. Ir. Acad. 1841, p. 91). The cilia of the eight ribs were seen by him in uninterrupted motion; and, therefore, he considers them not merely as organs of motion, but also of respiration. He could not observe phosphorescence in this *Medusa*, which he thought he did in *Bolina hibernica* (ibid. p. 154). The ovaries, according to Krohn's account, are to be found situated under the eight ribs (Fror. Neue Notiz. B. 17, p. 52).

Milne Edwards found the ribbed *Medusæ* described by different

Zoologists* as *Beroë ovatus*, *elongatus*, *Idya Forskalii*, and *Beroë Chiajii*, very abundant at Nizza, and he declares them to be nothing else but different degrees of age of one and the same species, which, without farther discussing the synonymes, he comprehends under the name of *Beroë Forskalii* (Ann. d. Sc. Nat. t. 16, 1841, p. 193). In this *Beroë*, Milne Edwards remarked a red pear-shaped eye, which rested on a ganglion-like swelling, in a groove situated opposite the mouth, and contained several crystalline corpuscles. The cavity of the mouth of this *Medusa* stretches almost through the whole body, and passes at the base into a small cavity, surrounded by two padded lips, which may be compared to a stomach; from this issue two vessels, which divide into eight principal trunks, and at the end of the mouth, discharge together into one circular vessel, on the way anastomosing with each other, by means of lateral branches. In this vascular system the nourishing fluid, which contains colourless round corpuscles, is put in motion by vibratory cilia. The cavity of the stomach discharges also externally, by means of two openings in the vicinity of the eye.

Milne Edwards has described a new *Beroid*, found at Nizza, under the name of *Lesueurina vitrea*. It ranks very near the genus *Mnemiopsis* of Eschscholtz, and the genus *Alcinopsis* of Rang. Its wide-cleft mouth is covered with a multitude of contractile threads; the cavity of the mouth reaches to the upper third of the oval and laterally compressed body; in the upper half of this cavity two double-folded lamellæ run along the walls, and may be considered as the ovarium. In the bottom of this cavity is found an opening, by which we arrive at the stomach, which is covered on its inner surface by a vibratory epithelium, and sends out four vessels, which pass through the body, and contain a colourless fluid, moved by vibratory cilia. In a groove found at the end of the posterior extremity of the body, is a red organ, similar to that which Milne Edwards found in *Beroë*. The same Naturalist discovered at Cetta a new discoid *Medusa*, which, as it stands very near the *Aequorea forskalini* and *ciliata*, has been called by him *Aeq. violacea*. Seventy-four canals pass from the very roomy stomach of this *Medusa* to the margin of the disc, where they unite into one circular vessel. The sexual parts form on the under surface of the disc folded lamellæ, which embrace the seventy-four radial vessels, and with their under margin float free in the water. He observed in these lamellæ, in some individuals, only eggs, in others spermatozoa.

A new *Medusa* has been found by Forbes on the north coast of Ireland, which belongs to the genus *Hippocrene*, characterized by Brandt (Ann. Nat. Hist. vii. p. 82). The *Cyrtopsis octopunctata*, formerly described by Sars, Forbes has declared to be also a *Hippocrene*, the species of which he sums up as follows:—*H. Bugainvillii*, Br.: stomachal appendages as long as the proboscis, eight, the four larger ones oblong,

yellow, with red centres; tentaculiferous glands four, red and yellow, with pink tentacula; umbrella in part pilose.—*H. britannica*, Forb.: stomachal appendages as long as the proboscis, four, equal, yellow; tentaculiferous glands four, red and white, with white tentacula; umbrella smooth.—*H. octopunctata*, Sars.: stomachal appendages shorter than proboscis, four, unequal; tentaculiferous glands eight, black; umbrella smooth.

Forbes had added four new species of *Thaumantias*, found in the British Seas, to the four species previously made known by Eschscholtz and Sars, viz.:—*Th. pileata*: umbrella cap-shaped, oral peduncle and clubs of the vessels pink; proboscis four-cleft at the mouth, lobes acute; eyes large, black and yellow, on the bulbous origins of the twenty tentacula.—*Th. Thompsonii*: umbrella hemispherical, very convex; proboscis four-cleft, lobes triangular; clubs of the vessels, proboscis, and bases of tentacula yellow; eyes minute, black, on the triangular bases of the sixteen tentacula.—*Th. punctata*: umbrella hemispherical, clubs and proboscis pink; proboscis four-cleft, lobes sub-acute; eyes large, black, on the bulbous bases of the thirty-two tentacula.—*Th. sarnica*: umbrella hemispherical, clubs and proboscis bluish; proboscis four-cleft, lobes acute; eyes? tentacula twenty.

Mrs. Davis has described a very small *Medusa*, under the name of *Cyanæa coccinea* (ibid. p. 235). She kept it for several weeks alive in a glass. Its form is campanulate, translucent, with four faint rays; in the centre a red ball, with four white arms, forming a cross; at the margin of the disc numerous tentacula. The editor of the *Annals* regards this *Medusa* not as a *Cyanæa*, but rather as a species of *Oceania*, allied to *O. cacuminata*, Esch.

Rud. Wagner has published a very interesting contribution to the knowledge of the structure of the *Pelagia noctiluca* (Über den Bau der *Pelagia Noctiluca* und die Organisation der Medusen, 1841). He mentions also the presence of *Medusæ* in the Gulf of Villafranca, the general vital phenomena of the *Pelagia noctiluca*, their luminous and urticating qualities (Arch. 1841, i. p. 38); and holds, that all the *Medusæ* belonging to the genera *Aurelia*, *Cyanea*, *Pelagia*, *Oceania*, and *Cassiopeia* are bi-sexual. Separate sexual organs have also been recognised by Kölliker, in *Rhizostoma Cuvieri*, *Chrysaora isoscela*, and *Æquorea helleana*. It is rather strange, that Ehrenberg will not admit, that the discovery of separate sexes in the *Medusa* is proved (ibid, 1842, i. p. 67). He says, that it is a thing unheard of, that the organization of the male and female of an animal species should be the same, not merely in form, but even to the anatomy of the sexual parts. No one has ever asserted such a resemblance. The male and female individuals of the *Medusa aurita* are neither in external form, nor in the intimate structure of the sexual parts, alike in the grown state. The females have a

number of pouches in their grasping-arms, for the reception of the eggs and brood, which the males want entirely. The band-stripes, situated in the folds, which Ehrenberg considered as pouches, contain the female egg-germs imbedded in the parenchyma, to which exit is given by the dehiscence of its outer covering of epithelium. In the male these bands contain an innumerable multitude of small, thick-walled, testicular sacs, which discharge on the surface of the band turned to the branchial cavity, and in which spermatozoa are developed from the cells, according to known physiological laws. When Ehrenberg thought he recognised undeveloped eggs between masses of spermatozoa, in the sexual apparatus of the *Medusæ*, they were evidently the above-mentioned cells, in which the spermatozoa had not yet developed themselves. The reporter would here especially give warning, that every thing resembling an egg-germ should not be held for an egg. By the discovery of the cellular development, Schwann has solved for us the enigma, that the contents of a testis may completely resemble those of an ovary. Ehrenberg has also made some observations on the stinging-organs of *Cyanea capillata*. He found them only on the fang-threads of this animal, which it could elongate to twenty-five feet. Their construction is quite like those of the *Hydræ*, only wanting the hooks.

The correctness of the reporter's description of the first stages of development of the *Medusa aurita* has been confirmed by Sars, in an excellent treatise on the development of that animal and *Cyanea capillata*; and Sars has also proved, that the animal described by him as *Strobila*, is only a young state of the same *Medusa*. Steenstrup quotes this remarkable metamorphosis of the *Med. aurita* as an example of that phenomenon, styled by him "Generationswechsel" (transmutable generation); and he considers the polype-like individuals, out of which, by transverse section, a number of disc-shaped young *Medusæ* proceed, as the nurses of these young ones.

According to the observations of Philippi, *Physophora tetrasticha* is not a compound animal (Fror. N. Notiz. Bd. 22, p. 344, and Bd. 23, p. 88). The cavity at the end of the axis of this animal is neither filled with air nor provided with an opening; neither are the swimming-bladders filled with air; and the fang-arms are neither gills nor holders of fluid; the stomach is not in connection with the hollow axes; and the animal possesses organs of both sexes.

A *Stephanomia* has been discovered by Milne Edwards in the Gulf of Villafranca, which is very nearly allied to the genus *Apolemia*, Esch., and has been called by him, on account of the spiral rolled-up rachis, *Steph. contorta* (Ann. d. Sc. Nat. t. 16, p. 217). In the upper end of the body of this *Medusa* is found a pear-shaped hollow organ, which, besides a reddish fluid, contains an air-bladder open beneath. The band-shaped spiral body has three different appendages at its margin.

One sort of appendage serves for swimming, and resembles a hollow obtuse cone, which can pump water out and in, by opening and shutting its cavity; the second sort is very complicated, consisting of a pedicle, a boat-shaped flap, an irregularly spiral cirrhous, and a number of tender very contractile spiral threads, with a larger pear-shaped hollow body, which is perhaps for the reception of nourishment; the third sort consists of pedicled, smaller, pear-shaped, and very contractile sacs, with which some bodies, like clusters of grapes, are in connection. The latter contain evident spermatozoa, while the larger pear-shaped bodies must contain the ovaries. He has also given some notices on the structure of the *Stephanomia prolifera*, of which Milne Edwards, however, found only mutilated specimens at Nizza.

Hyndman has discovered a new *Diphya* on the coast of Ireland, which he has named *Diphya elongata*, and characterized thus:—both portions of similar form and nearly equal size; the swimming cavity of each likewise similar, and, as well as the nutritive organ, extending the whole length of the body. A circulation was discovered, commencing in the canal, which originates at the base of the tentacular appendage, and continuing throughout the nutritive organ. Costa has also recognised a distinct circulation in *Velella* (Comptes Rend. t. 13, p. 533, l'Institut. 1841, p. 301, and Ann. d. Sc. Nat. t. 16, p. 187).

POLYSES.

WE are especially indebted to British Naturalists, during the last year, for much interesting information on the anatomical structure and geographical distribution of the *Polypes*.

Hassall has added a valuable supplement to the catalogue of Irish *Zoophytes* (Ann. Nat. Hist. vol. vii. p. 276 and 363), in which the following species are mentioned:—*Coryne squamata*; *Hermia glandulosa*; *Tubularia larynx*; *Thoa muricata*; *Sertularia margareta*, *pumila*, *flicula*; *Thujaria articulata*; *Plumularia pinnata*, *setacea*, *catharina*, *cristata*, *myriophyllum*, *frutescens*; *Alcyonidium rubrum*; *Actinia mesembrianthemum*, *bellis*, *gemmacea*, *dianthus*, *maculata*; *Anthea cereus*; *Valkeria cuscuta*, *imbricata*, *pustulosa*; *Pedicellina echinata*; *Vesicularia spinosa*; *Hippothoa lanceolata*; *Anguinaria spatulata*; *Tubulipora verrucaria*, *lobulata*(?); *Cellepora ramulosa*, *bimucronata*; *Berenice hyalina*; *Lepralia nitida*, *coccinea*, *variolosa*, *ciliata*, *apensa*, *pediostoma*, *insignis*, *cylindrica*, *punctata*, *linearis*; *Membranipora stellata*; *Flustra truncata*, *avicularis*, *lineata*, *tuberculata*, *distans*, *carnosa*, *hibernica*; *Alcyonidium gelatinosum*, *hirsutum*, *parasiticum*, *echinatum*.

The following *Zoophytes* have been added by Thompson to the Fauna of Ireland (ibid. p. 481):—*Hydra viridis*, *Actinia viduata*, Mull., and *Cliona celata*, Grant.

The *Zoophytes* which are found on the coast of Aberdeen, have been enumerated by Macgillivray, and comprehend the following species (ibid. vol. ix. p. 462):—*Coryne squamata*; *Echinocorium clavigerum*, Hass.; *Tubularia indivisa*, *larynx* and *ramea*; *Thoa halicina* and *muricata*; *Sertularia*, with eleven species; *Thujaria thuja*; *Antennularia antennina*; *Plumularia*, with five species; *Laomedea dichotoma*, *geniculata*, and *gelatinosa*; *Campanularia*, with four species; *Alcyonium digitatum*; *Actinia gemmacea* and *dianthus*; *Crisia*, with three species; *Notamia lorculata*; *Tubulipora patina* and *serpens*; *Discopora hispida* (?); *Cellepora*, with four species; *Lepralia*, with six species; *Membranipora pilosa*; *Flustra*, with four species; *Cellularia scruposa* and *reptans*; *Farcimia sinuosa*, Hass.; *Alcyonidium*, with three species; and *Cliona celata*.

The *Zoophytes* of the coast of Cornwall have been enumerated by Couch, among which *Flustra Pêachii* is mentioned as a new species (ibid. vol. x. p. 60).

A new *Actinia* has been described by Forbes, under the generic name *Capnea*, with the following character (ibid. vol. vii. p. 81):—Body cylindric, invested in part by a lobed epidermis, and adhering by a broad base; tentacula simple, very short, retractile, surrounding the mouth in concentric series. The only species, *Capnea sanguinea*, was discovered in deep water in the Irish Sea. The tentacula are arranged in three series, sixteen in each; the epidermis, which is eight-cleft at its upper part, is of a brown colour; the body is elsewhere vivid vermilion. He has also described another *Actinia*, found in the Ægean Sea (ibid. vol. viii. p. 243), which has a vermiform appearance, and lives free, in a self-constructed tube under the sea-sand. The animal is allied to the *Edwardsia*, which is yet to be mentioned, but differs from it chiefly by the circles of tentacula, of which that of the margin of the mouth is composed of numerous short tentacula, while the margin of the disc is covered by a circle, consisting of thirty-two larger tentacula; these are yellow and brown spotted, and, in retracting, are not concealed by the external cuticular covering. The disc and oral tentacula are white, as well as the upper part of the body; the remainder to the extremity is yellowish-brown. It is protected by a membranous tube, which is itself strengthened by an incrustation of gravel and shells, in the manner of a *Terebella*. If the animal be injured, it leaves its tube, and moves about in the water like an *Annelide*. On being supplied with sand and gravel, it proceeded to construct another tube, rolling itself in the sand, and secreting glutinous matter for the membranous lining. It eats voraciously, and attacks other animals that come within

reach of its tentacula. Internally, its structure is similar to that of others of its tribe.

A new genus of *Actinia* has been characterized by Quatrefages, under the name of *Edwardsia* (Ann. de Sc. Nat. t. xviii. p. 65), the species of which, like that of Forbes just mentioned, do not fix themselves by a foot, but live free in the sea-sand. The body is cylindric and vermiform when stretched out, posteriorly rounded and swollen. Quatrefages has given the following diagnosis of this remarkable *Zoophyte*:—"Corpus liberum, vermiforme; pars media plus minusve epidermate opaco incrassata, pars anterior pellucida, tentaculis ornata; posterior autem vitrea, rotundata, basi vix instructa; utraque exsertilis et retractilis. Intestinum rectum, mesenterio interrupto suspensum, posterius large apertum, duabus partibus compositum: Sinus octo posteriori intus eminentes quibus pendent totidem ovaria, usque ad extremum abdomen producti." Quatrefages has discovered three different species of this genus in the Channel, on the French coast. The first species, *Edwardsia Beutempsii*, is 6-7 centim. long, of a yellowish-red colour, passing posteriorly into yellowish-green or blue. As specifically different from the other two, it is characterized:—"Ore terminale in extremitate papillæ subconicæ, circum basim tentaculatæ; tentaculis 14-16 uniseriatis; parte media subpolygonali; epidermate crasso, opacissimo, fulvo-rubente." The second species, *Edwardsia timida*, is also 6-7 centim. long, and possesses the following specific character:—"Apice plano, tentaculis 20-24 uniseriatis circumdato; parte media vix subpolygonali; epidermate tenui, paululum translucido, fulvo." The third species, *Edwardsia Harassi*, is only 5½ centim. long, and is distinguished by the following characters:—"Papilla terminali rotundata, tentaculis 24 biseriatis ad basim circumdata; parte media cylindrica; epidermate crasso, opacissimo, obscure fulvo." These *Actinæ* inhabit such spots of the sandy sea-mud as are caused by the alternation of the ebb and flow of the tide; in the ebb they retreat within their tubes. They are extremely contractile, and can, like the *Holothuriæ*, eject their intestinal canal out of the body. Each of these three species use their tentacles in a peculiar manner in unfolding and expanding. In the *Edw. Beutempsii* the tentacles are stiff; in the *Edw. timida* they are spread out irregularly, and are in constant motion; and in the *Edw. Harassi* one row is directed stiffly upwards, the other downwards. The motions of these *Actinæ* are altogether vermiform; their food consists of small *Crustacea* and *Spirorbes*. Quatrefages kept them in a glass with sea-water, and remarked that they cast the skin. Their whole body was covered with the stinging organs peculiar to all *Actinæ*. The intestinal canal passes straight through the cavity of the body; its external surface, as well as the internal surface of the cavity, is covered by a vibratory epithelium. The ovaries

are like yellow cords fastened down to the intestines. Quatrefages could not distinguish the testes, nor a nervous nor vascular system in these animals. The tentacles are hollow, and covered with a vibratory epithelium, which, with the cilia of the cavity of the body, cause the fluid found in it to move up and down; so that it appears as if these cilia could change their motions at will. By these *Edwardiæ* the *Actiniæ* are connected with the *Holothuriæ*, particularly with the genus *Synapta*.

R. Wagner (Arch. 1841, i. p. 41) has become convinced, by recent investigation, that the organs of the *Actiniæ*, previously described by him as seminal animalcules (Arch. 1835, ii. p. 205), are the stinging organs of these zoophytes. Kölliker has also discovered these organs, but never could perceive any motion in them (Beitr. ant. cit. p. 44). This may be influenced by the sexual organism of the *Actiniæ*, and also by the season of the year; for, according to Erdl's account, the stinging organs of the *Actiniæ*, when in heat, are differently shaped from those of individuals not in that state, and display in spring much more activity than in autumn (Müll. Arch, 1841, p. 426, and 1842, p. 305). Besides these stinging organs, male parts of generation have also been discovered in the *Actiniæ* by Kölliker as well as Erdl; and the latter has become convinced of the separate sexes of these animals. The sexual organs here form bands, with many folds, resting under the mantle, on the longitudinal muscular ledges, and one corner of the side floats free. In the male, these band-formed processes contain a quantity of testicular sacs; in the female, a number of eggs. The sacs contain elongated bundles of spermatozoa, of which the moveable ones consist of an oval body and fine pilose appendage. When the time of heat in the *Actinæ* is past, there is no farther trace of sexual parts. According to this, Ehrenberg's view, that the stinging organs are the spermatozoa of these animals, is not tenable (Archiv. 1842, i. p. 73).

A description of the young of the *Actinia mesembrianthemum* has been given by Rathke (Neueste Danzig. Schrift. Bd. 111, Hft. 4, p. 112), which were found in the stomach of two grown individuals. The largest was three lines high, the smallest half a line. They were rose-coloured, and the circle of tentacles of the smallest individuals contained ten; and the ring of the mantle was wanting, while it was completely formed in the larger individuals.

A monograph, published by Leuckart, is confined chiefly to the mushroom corals. There are described in it two genera, *Fungia*, with eight species, containing the new one *F. dentigera*; and *Herpolitha*, with six species, containing the new one *H. Rüppellii* (Observationes Zoologicae de Zoophytis Coralliis speciatim de genere Fungia, 1841).

A new Gorgonian coral has been described by Philippi, under the name of *Bebryce mollis* (Arch. 1842, i. p. 35), which he found in the form of little branched stems, of three to four inches high, on *Oculina ramea*.

He also found at Naples another very small zoophyte, of the family of the *Xenia*, upon *Balani* and oyster shells, which he describes as *Evagora rosea*. The eight-armed polypi of this zoophyte (2''' long) can retract themselves completely into their lower leather-like basis. The same Naturalist has pointed out the presence of the *Iais elongata* in the Mediterranean; and mentions six species of *Cyathina*, Ehrenb., also found there, among which are three new species, *Cyath. angulosa*, *pulchella*, and *striata*.

A new zoophyte, belonging to the *Alcyoniduke*, has been discovered by Hassall on the Irish coast, and placed in a particular genus, *Cycloum* (Ann. Nat. Hist. vii. p. 483). Its character is given as follows:—Polypidom fleshy, encrusting, covered with numerous imperforate papillæ. The only species, *Cycloum papillosum*, has polypi with eighteen tentacula disposed in the form of a bell. It is found upon *Fucus serratus*.—Another new genus Hassall has named *Sarcochitum*. In this zoophyte, the polypidom is fleshy and encrusting, covered with numerous prominences of irregular form and unequal size, from which the polypi issue. The only species, *Sarcochitum polyoum*, is also found on *Fucus serratus*, and has polypi with twenty tentacula.

Stinging organs have been recognised by Erdl in the fang-arms of the *Alcyonium exos* (Müll. Arch. 1841, p. 28). He has also subjected *Veretillum cynomorium* to a more exact investigation (ibid. p. 43), and given an excellent figure (R. Wagner, Icones Zootom. tab. 34, fig. 1 and 4-7). The male and female polypes of this *Veretillum*, recognised by him, differ from each other in this respect, that in the latter the eggs hang together in the foot like a bunch of grapes, by means of pedicles; while, in the former, the seminal capsules are fastened together on the same spot.

Costa has assured us, that *Pennatula* rests at the bottom of the sea in the mud, and that what are called the polypes are only peculiar organs of one and the same animal (Fror. N. Notiz. Bd. 21, p. 154). These relations, as well as the presence of a nervous system, must, according to him, bring *Pennatula* near to *Encrinus*.

Laurent has made *Hydra grisea* the object of his investigation in several treatises, and mentioned many singular views (Fror. N. Notiz. Bd. 24, p. 81 and 100). He denies, among others, the existence of the hastæ of *Corda*, and asserts, that the hook-threads, with their hooks, are only a glutinous sap spun out, and enlarged at the loose or free extremity. If the reporter should grant that thread originates in this way, he cannot conceive how the hooks, with their little bladders, should only be at the swollen end of such melted slime. It must be a very unpractised eye that could mistake this hook apparatus in the way Laurent has done. He does not agree, besides, that the spot at the origin of the foot is an ovary, because it presents the same structure as

all the other parts of the body; but the reporter must definitely assert, that it does form an ovary at certain seasons, in the same way that the testes are developed from that part of the body which is situated between the origin of the tentacula and the foot, which Laurent considers as pustules, and which, according to his opinion, must originate from a faulty construction of the medium surrounding the polypi, which the reporter cannot assent to, as he observed the testes, with their living spermatozoa, not only in those *Hydræ* which he kept, but also in those which he had collected from fresh water.

Ehrenberg saw both sexes united in the *Hydra viridis*, but he also remarked individuals, that possessed male or female organs only (Fror. N. Notiz. Bd. 22, p. 58). He could not discover any urticating qualities in the *Hydra* (Arch. 1842, i. p. 72), and therefore thinks, that the fang-hooks and poison pustules of the *Hydræ* cannot be called stinging-organs. Erdl corrects Ehrenberg's description of the hook-organs of *Hydra* in this respect (Müll. Arch. 1841, p. 429), that it is not the round part of the organ which first proceeds from a wart of the fang-arm, but always the thread, then the neck with the spines, and lastly, the round part; and this the reporter can fully confirm. According to his observation, the *Hydræ* fling these threads with the poison pustules towards the animals, which they seize and remain fixed to; they also hang abundantly on the arms of the *Hydræ* themselves, by which the poison bladder floats in the water. Ehrenberg has been deceived by this, and erroneously assumed, that the poison bladder first comes from the arms; for this reason, the *Hydræ* could not, with these organs, which cannot at all be properly called hooked-organs, lay hold of any animal; and they are much more correctly defined by the name of poison organs, since they have an active poisonous effect on small insects, *Crustacea* and *Annelides*, which die so soon as they are only touched by a pair of these organs. The bristle-shaped short threads, which project from the small oval corpuscles found by Corda, are used by the *Hydræ* for holding their prey (Ann. d. Sc. Nat. t. viii. pl. 18, fig. 5).

Hassall has described, under the name *Echinochorium*, a polype allied to *Coryne* (Ann. Nat. Hist. vol. vii. p. 371). The polypidom is encrusting; surface raised into numerous rough papillæ; polypi hydroid, naked, pedicellated. They have, in the only species, *Echin. clavigerum*, a clavate shape, are not retractile within cells, and are furnished with claviform tentacula. Another *Coryne*-like genus has been discovered at Naples by Philippi, upon *Conchylia* (Arch. 1842, i. p. 37). The small two lines long twelve-armed polypi rest here upon a general cuticular expansion.

Steenstrup has observed a new *Coryne* in Iceland, and has named it *Coryne fritillaria* (Über den Generationswechsel, p. 20). It consists of

a stalk, at the end of which is fixed a polype head, surrounded by five or six tentacula, from which hang four four-sided campanulate bodies, which he did not consider as organs of the *Coryne*, but as separate individuals. In each corner of the free margin of the campanulate body was a red ocellated spot, and in the base of the whole appeared a four-cornered stomach. These bodies, which had much motion, at last tore themselves free, and swam about in the sea like *Medusæ*. Steenstrup, at the same time, recalls to mind the *Corymorphæ nutans* of Sars, which bears similar bodies to those of his *Coryne fritillaria*; and he deems it probable, that the bodies in *Corymorphæ* also separate and become changed into free swimming *Medusæ*. Finally, he expresses an opinion, that the polype-knobs are only the nurses of the Medusa-like animals, and that in *Coryne fritillaria* and *Corymorphæ nutans*, Sars, the eggs are first formed into the bell-shaped individuals after they are separated from their nurse, the polype-knob; whilst in *Coryne echinata* and *vulgaris*, Wagn., and in *Syncoryne ramosa*, Sars, the eggs are already developed in the campanulate bodies, before they have left the polype-knobs.

Van Beneden has described a polype, connecting the *Actinia* and *Hydra*, under the name of *Hydractinia* (Bull. de l'Acad. Voy. d. Sc. de Brux. t. viii. f. 1, p. 89, and l'Institut. 1841, p. 166).

Quatrefages has found an almost microscopic polype, of $\frac{1}{2}$ a millimetre in diameter, on the French coast, in a slough among sea-plants, and has made it known as *Eleutheria dichotoma* (Ann. d. Sc. Natur. t. 18, 1842, p. 270). It is destitute of feet, but moves freely about with its branchy arms. The following are its generic characters:—Without feet, eye-points on the basis of the arms. The specific character is:—Body hemispherical, of a yellow colour, and sprinkled with red points on its posterior and under side, six double forked tentacula, which end in roundish swellings. The animal lives on small *Crustacea*, and quickly contracts itself on being touched. The cuticular covering is full of peculiar cells (poison-organs), from which a fine prickle projects. They chiefly abound on the swellings of the arms. The cavity of the arms communicates with that of the simple stomach. The eggs are developed in the under part of the body, between the cuticular covering and the bottom of the stomach; they have a spherical shape, but no germ pustules can be detected within them.

Hassall has investigated a great number of *Lepraliæ*, in their various stages of life, according to locality, age, &c.; and has described six new species,—*Lepralia semilunaris*, *auriculata*, *ventricosa*, *tenuis*, *assimilis*, and *ovalis* (Ann. Nat. Hist. ix. p. 407).

Landsborough, who has made many experiments on the phosphorescence of the *Sertulariæ* (ibid. viii. p. 257, and Fror. Neue Notiz. Bd. 21, p. 83), has discovered, that on shaking, under water, *Valckeria cuscuta*, *Sertularia polyzonias*, *Cellularia reptans*, *Laomedea geniculata*,

Flustra membranacea, *pilosa*, and *Membranipora stellata*, emitted sparks. After he had taken these *Zoophytes* out of the water, together with the sea-weed to which they were attached, and left them dry for two days, the *Membranipora stellata* and *Flustra membranacea* still shed light; but this property was always destroyed by frost. Hassall has confirmed this account (ibid. viii. p. 341).

Kölliker has published his observations on the male organs of generation of the *Flustræ* (Beitr. ant. cit. p. 46).

The appendages of the *Cellularia avicularia*, resembling a bird's head, have been minutely examined by Nordmann (Observations sur la Faune Pontique, 1840, p. 679). The mass of this appendage is calcareous, the bill opens and shuts, whilst the head turns from one side to the other; all these motions are quite independent of the unfolding of the tentacula of the polype. In *Bicellaria scruposa*, Nordmann observed similar moveable bodies, the use of which he has not yet been able to make out. He saw the fourteen tentacula of the polypes of *Cellularia*, placed in a circle, and covered with vibratile cilia. The increase of the *Cellularia*, according to his observation, goes on in a fourfold manner, by stolons, gemmules, and two sorts of eggs.

Various remarks have been made on the organization of the tufts of polypi in fresh-water, as well as on their development, by Coste (Compt. Rend. t. xii. p. 724, and Fror. Neue Notiz. Bd. 19, p. 10), and Laurent (l'Institut. 1841, p. 225). We are indebted to Nordmann for a very exact description of the *Plumatella campanulata*, of which *Plumatella repens*, Müll., is only a variety. This sort of polypo is also propagated by gemmules, and two sorts of eggs, namely, summer and winter eggs.

Hassall has observed (Ann. Nat. Hist. x. p. 153, and Fror. Neue Notiz. Bd. 24, p. 90), that *Plumatella repens* and *Alcyonidium stagnorum*, belong to the same genus, and perhaps even to the same species, for the difference in the mode of branching can scarcely be regarded as affording a character of generic importance. *Plumatella repens* is only attached to leaves, which, after a few weeks, become decomposed, involving the *Zoophytes* upon them in their own destruction; *Alcyonidium*, on the contrary, attaches itself to stems of vegetables, and other firm substances, which do not decay so soon; and allow time for some of the specimens to become as large as the closed hand.

Johnston has turned his attention to the *Sponges* and *Lithophytes* (History of British Sponges and Lithophytes, 1842). He could not convince himself that these forms actually belong to the animal kingdom, for he found no animal irritability in the sponges, nor could he find polypes nor animal viscera in them. So long as the sponges are fresh and lively, they draw in and put out water, as he has very distinctly observed in *Halichondria papillaris*, Flem. He also saw them

throw out small excremental grains. The cause of the circulation of water through them he could not discover; but he is convinced, that it does not originate from any insect accidentally concealed and breathing in the sponge, as Hogg some time since asserted (*Ann. Nat. Hist.* vi. p. 318; *Transact. of Linn. Soc.* vol. xviii. p. 363; *Trans. Ent. Soc.* vol. iii. p. 105).

Johnston has sometimes found oval corpuscles in *Tethea* and *Halichondria*, which were composed of a gelatinous substance, with numerous spicula imbedded in it; but he supposes they are not eggs, since they did not at all agree with those ciliated eggs which Grant had discovered in several species, and which have been again mentioned by Laurent (*l'Institut.* 1841. 242).

Johnston assumes, that the sponges increase by a sort of self-division, small particles detaching themselves from the gelatinous fluid, and developing into their species, after they have become fixed on an appropriate site.

Sponges consist of a loose, elastic, fibrous, or porous substance, in which spicula are often imbedded. Besides the numerous pores, still larger openings are found on different spots of the surface, from which canals pass, in the most various directions, through their substance. The fibres in the proper sponges are cylindrical, of unequal thickness, and reticularly united together; in *Tethea*, *Halichondria*, and *Spongilla*, there are siliceous spicula in this fibrous web, and in *Grantia* calcareous ones. Johnston divides the British Sponges into eight genera:—*Tethea*, with two species, *T. cranium* and *lyncurium*; *Halichondria*, with thirty-six species, two of which are new; *Spongilla*, with two species, the *fluvialis* and *lacustris*; *Spongia*, with three, *limbata*, *pulchella*, and *laevigata*; *Grantia*, with eight species; *Duseideia* has two, *fragilis* and *papillosa*; *Halisarca*, of which the only species is *H. Dujardinii*; *Geodia*, *G. zetlandica*; and *Pachymatisma*, also with a single species, *P. Johnstonii*.

He next compares the different views of Naturalists respecting the *Lithophytes*, which are sometimes reckoned with the vegetable, sometimes with the animal kingdom. He coincides with those who believe them to be vegetables, since they are formed quite differently from the zoophytes, and bear no polypi. The British *Lithophytes* form two families; *Corallineæ*, of vegetable form, branchy and articulated; and *Nulliporidae*. Of the former are mentioned *Corallina*, with three species; *Jania*, with two species; and *Halimeda*, with one species. Of the latter, *Nullipora* is the sole genus, with four species.

Bowerbank has examined a keratose sponge from Australia (*Ann. Nat. Hist.* vii. p. 129). He found siliceous spicula, of various shapes, imbedded between the horny fibres, and here and there groups of round bodies, which he did not know whether to consider as gemmules or eggs.

He has also examined the intimate structure of the *Corallina* (Edin. New Phil. Journ. vol. xxiii. 1842, p. 206, or Fror. Neue Notiz. Bd. 23, p. 154). After removing the calcareous portions by means of nitric acid, he saw a tissue of net-work, and sometimes also siliceous spicula remaining; and between the tissue gemmular bodies, which, in his opinion, must have been polype germs.

A new classification of the sponges has been proposed by Hogg (Ann. Nat. Hist. viii. p. 3), in which he divides them into five sections, according to the construction of their parenchyma: 1. *Spongia subcornea*, parenchyma without spicula; 2. *Spongia subcorneo-silicea*, parenchyma with numerous siliceous spicula; 3. *Spongia subcartilagineo-calcaria*, parenchyma with calcareous spicula; 4. *Spongia subcartilagineo-silicea*; and 5. *Spongia subereo-silicea*.

A new horny sponge has been described by Owen, under the name of *Euplectella aspergillum* (ibid. p. 222), which is cylindrical, hollow like a cornucopia, and composed of a regular net-work. The material of this resembles dried gluten, and burns away to a charry residuum.

FORAMINIFERA AND INFUSORIA.

EHRENBERG continues his researches into the microscopic organisms of the past and present world, and gives by them an always firmer and broader basis to the surprising conclusion he had come to, that these microscopic beings exercise the greatest influence on the solid surface of our earth.

He has convinced himself, that the calcareous rocks of Syria and of central North America, contain densely-crowded masses of small *Polythalamia* (Bericht über die zur Bekanntmachung geeigneten Verhandl. der Königl. Akad. der Wissenschaften zu Berlin, 1842, p. 187), several species of which, from the North American limestone, completely agree with the *Polythalamia* of the European chalk.

Ehrenberg also found the plastic marl of *Ægina* to consist of small organisms, several species of which belong to the chalk animalcules (ibid. p. 263). He mentions, moreover, that the limestone hills of Lake Onega, in Russia, consist partly of small *Polythalamia* (ibid. p. 273). He has also taken some pains to investigate the structure of these wonderful chalk animalcules (Abhandl. d. Kön. Akad. d. Wissensch. in Berlin, 1841, p. 106). He recognised no external, but only an internal body covering the shell of these animals, which allowed very long, fine, expansible, palpal threads, to pass out from all parts of the cribriform shell. He does not confirm the account of D'Orbigny, that all these animalcules possess a protrusible head, covered by a plumular palpal apparatus. According to the researches of Dujardin, the animal of the

Polythalamia is also an internal one, which is completely enveloped by the shell (Microscop. Journ. 1841, p. 104).

A very comprehensive work, by Dujardin, on the *Infusoria*, has appeared (Histoiro Nat. des Zooph. Infusoires, 1841). He separates this class into two great divisions. Of these, that of the asymmetrical *Infusoria* corresponds to the polygastric of Ehrenberg; whilst the other, under the definition of *Systolides*, comprehends the *Rotatoria* of Ehrenberg, with the *Tardigrades*, which latter have not hitherto been properly accommodated to any class of the invertebrata. Doyère has also attempted to prove an alliance of the *Tardigrades* with several *Rotatoria*, viz.,—*Notommata*, *Diglena*, *Distemma*, *Monocerca*, and *Mastigocerca* (Ann. d. Sc. Nat. t. 17, p. 193), the mouths of which particularly remind us of the *Tardigrades*. Doyère, at the same time, draws attention to the similarity of their muscular parts, their cuticular covering which does not become absorbed, the intestinal canal, and the unproportionably large eggs in both groups of animals. He has also repeated his experiments on the revivification of the *Tardigrada*, *Rotifera*, and *Anguilulæ* (Ann. d. Sc. Nat. t. 18, p. 5, l'Institut. 1842, p. 289, Fror. Neue Notiz. Bd. 24, p. 232), and has proved, that these animals can be completely dried in pure sand, in the open air, in dry air, and in a vacuum, without losing the capability of being again revived by moisture. When these animals were put into hot water of 50 centigr. they were killed outright; but they retained the power of revival when the water was at 45 to 48 centigr. When dried individuals were subjected to a great heat, there were found among them some which could be revived by moisture, even after they had sustained 120–140–145 degrees. He also mentions two new species of *Macrobiotus*, discovered by Quatrefages (Ann. d. Sc. Nat. t. 18, p. 34). Ehrenberg has discovered a new infusorian belonging to the *Rotatoria*, at Wismar, in the Baltic, and named it *Dipodina arcticon* (Frör. Neue Notiz. Bt. 24, p. 184). He defines it as approximating the genus *Notommata*, by a particular construction of its tarsal nippers. An infusorian, living in the *Vaucheria clavata*, has been made known by Morren as *Rotifer vulgaris* (ibid. Bd. 18, p. 101).

Doyère points out some contradictions of Ehrenberg, which have occurred to him in his examination of the organs, regarded as the sexual parts of the *Rotatoria* (Ann. d. Sc. Nat. t. 17, p. 199). In several species of *Notommata*, *Synchaeta*, *Diglena*, &c., Ehrenberg defined two simple pouches as testes. In several species of *Hydatina*, *Notommata*, *Cycloglena*, *Euchlanis*, and *Brachionus*, these two pouches are covered with vibrating branchial appendages, and discharge into a contractile organ (*vesicula seminalis*, Ehrenb.) On the other hand, in *Notommata myrmeleo*, *syrinx*, and *clavulata*, in which two simple pouches, and one furnished with vibratile branchial appendages, discharge into a contractile organ, the simple pouches, and not that with

the appendages, were taken for testes by Ehrenberg, without any exact reason being given. Doyère on this remarks, very properly, that it must astonish us, how a contractile organ, which uninterruptedly contracts and expands itself, taking into it a fluid, and the next moment again rejecting it, can perform the function of a vesicula seminalis. He farther doubts, whether an organ like that above mentioned, covered with vibratile appendages, and constantly present in equal development, can be a vesicula seminalis and testis, for in other lower animals, the internal male parts of generation are only developed at certain times.

The ring-shaped streaks, asserted by Ehrenberg to be a vascular system, and which are so evident in *Hydatina senta*, *Enteroplæa hydatina*, *Synchaeta pectinata*, *Notommata collaris*, and others, are considered by Doyère as a cuticulo-muscular system, analogous to that described by him as the sterno-dorsal muscle in the *Tardigrades*.

A series of very extended labours by Werneck, on *Infusoria*, has been laid before the Berlin Academy of Sciences by Ehrenberg (Bericht über die Verhandl. d. Kön. Acad. der Wissensch. zu Berlin, 1841, p. 102 und 373). They contain a minute view of the internal structure of *Hydatina senta*, and very valuable observations on the polygastric animalcules, whose organs of nourishment he has not so completely made out as Ehrenberg has described them; and whose contractile bladders he also asserts to be vesiculæ seminales, without having recognised spermatozoa in them.

The organization of the polygastric *Infusoria*, as described by Ehrenberg, has lately been questioned from many quarters. Dujardin (Op. cit. p. 66) has called attention to the dislocations of the so-called stomachs of these creatures, which could not take place if they were in union with each other by canals. He also has opposed the view that they lay eggs, possess male sexual organs, and that their coloured spots are organs of sight. As the nature of these spots has also been contended by several other observers, it is to be hoped that this contention will call into the field, which has been opened up by the constant and great labour of Ehrenberg, a larger number of unprejudiced enquirers, acquainted with the use of the microscope.

Rymer Jones repeats the assertion, that he has observed in *Paramecium aurelia*, the gastric vesicles in regular and continuous circulation; nor had he, in any instance, been able to detect the central canal, or the branches leading from it to the vesicles. (A General Outline of the Animal Kingdom, and Manual of Compar. Anat. 1841, p. 59.)

Focke saw, in *Loxodes bursaria*, *Paramecium aurelia*, and other polygastric *Infusoria*, the cavities filled with pigments, intersecting each other in varied series, and concluded from this, that the digestive apparatus is not separated from the parenchyma, but that the parenchyma of these animals, consisting of cells, encloses the fluid nourishment received from without in narrow spaces, which may be compared with the

intercellular passages of plants (Amt. Ber. über die 20te Versamml. d. deut. Naturf. und Ärzte zu Mainz, Sept. 1843, p. 227).

Erdl has observed and described a peculiar circulation of the green globules in the body of the *Bursaria vernalis* (Müll. Arch. 1841, p. 278). The reporter has seen this circulation very distinctly in *Loxodes bursaria*, and supposes that Erdl has had the same animal before him, but to which he has assigned an erroneous name.

The organs of motion of a large *Navicula* have been recognised by Ehrenberg as long, fine, and contractile threads, which the animal can protrude from the shell (Abhandl. d. Kön. Akad. d. Wissensch. zu Berlin, 1841, p. 102).

According to Morren, the red pigment spots of *Lagenella*, *Cryptoglena*, and *Trachelomonas*, cannot be eyes (Mem. de l'Acad. Roy. des Sciences and des Belles Lettres de Brux. 1841, taf. 14), as in *Trachelomonas*, the red of the red spot can be distributed over the whole body, when the animal, on this supposition, would be quite changed into an eye. Neither does he consider the cavities in these *Monades* to be stomachs, although he has seen a mouth and anal opening in *Euglena sanguinea*.

Focke has mentioned, that *Pandorina morum* and other proboscided *Monades*, appear to change very much in colour according to temperature and season; and he found, in green and in red water, individuals quite colourless, as well as *Monades* saturated with the pigment (Ber. über die Versamml. d. Naturf. und Ärzte zu Mainz, a. a. O. p. 217).

Voigt has published his observations on the red snow (ibid. p. 217; the Microsc. Journ. 1841, p. 81; l'Institut. 1842, p. 259), the colour of which, according to him, is not caused by vegetable, but always by animal matter. The chief part of the snow is formed by the genus *Gyges*, the young of which has been considered by Shuttleworth as an *Astasia*, while the uncoloured shoots, by which the *Gyges* propagates itself, have been brought under the genus *Pandorina*. Besides these different forms of development of *Gyges*, there is also a peculiar *Bacillaria* and the *Philodina roseola* in the red snow.

Ehrenberg found, at Wismar, in the Baltic, that the *Peridinium tripos* and *fusus* belonged to the phosphorescent *Infusoria*, but some emitted light (Fror. N. Notiz. Bd. 24, p. 152). The latter animals were quite clear, while the phosphorescent individuals were filled with yellowish-brown matter, which he considered to be developed ovaries, so that here also the development of light appears connected with the development of the egg.

Experiments have been made by Purkinje, in the warm season, with rain water, in regard to the production of *Infusoria* (ibid. Bd. 22, p. 121 and 136, or Übers. der Arbeit. der Schles. Gesellsch. für Vaterl. Kultur im Jahre, 1841). In moist weather, their production was but sparingly observed; but in dry weather, manifold forms of these animals quickly appeared, belonging principally to the genera *Gonium*, *Volvox*, *Protus*, &c.

Fuchs constantly observed, in healthy cow's milk, two different *Infusoria*, a very small *Monade*, and a larger polygastric animalcule belonging to the bristle *Monades* (Gurlt und Hertwig, Magaz. f. die Thierheilk. 1841, p. 155). The blueness of the milk arises, according to his investigations, from the development and increase of an infusorian belonging to the genus *Vibrio*, which he calls *Vibr. cyanogenus*. He defines another, which causes milk to turn yellow, as *Vibr. xanthogenus*. The *Vibriones* die at a heat of 50–55° R. When frozen and again thawed, they continue to live, and Fuchs saw them, when they had been dried for three weeks, again come alive on being moistened.

According to the observations of Mitscherlich, a considerable deposit is, after some days, formed in the watery extract of expressed oil-seeds, of most of the green parts of vegetables, and of boiled animal substances, which might be supposed a product of decomposition of the substances dissolved in the fluid by means of the air, but which the microscope discovers to consist of living and dead *Vibriones* (Ber. über die Verhandl. der Königl. Akad. der Wissensch. zu Berlin, 1842, p. 265). These *Vibriones* are also very abundant in the intestinal canal of man as well as of beasts. Mitscherlich fed rabbits for a long while upon cabbage, artificially infected with *Vibriones*; yet he found fungi only, the result of fermentation, in the intestinal canal of these animals.

The highly interesting observations of Ehrenberg have determined the actual share of microscopic organisms in the blocking up of the harbours at Wismar and Pillau, as well as in the formation of the slime of the bed of the Elbe at Cuxhaven, and of the bottom of the Nile at Dongola, Nubia, and the Delta of Egypt (ibid. 1841, p. 127 and 201). He has also extended his observations to the distribution and influence of microscopic life in North and South America, and in Iceland. His experience enables him to distinguish the forms of microscopic animals in the small particles of earth hanging to plants in *Herbaria*, and to other bodies. He was able to show the Society of Naturalists at Berlin, living *Infusoria* sent from America, consisting chiefly of *Bacillaria* (Fror. N. Notiz. Bd. 23, p. 10).

Bailey has given a view of the fossil and living *Bacillaria* in the United States (Sillim. Amer. Journ. vol. xlii. p. 88, and vol. xliii. p. 321).

Ehrenberg has continued his observations on that great bed of *Infusoria*, the Lüneburg Heath (Bericht. über die Verhandl. der Akad. der Wissensch. zu Berlin, 1842, p. 292). He has given some information on the fossil *Infusoria* of Ireland; and drawn attention to a bed of them at Berlin (ibid. 1842, p. 321 and 336; 1841, p. 231 and 362), which seems to be the most extensive deposit yet known, and in which, it is remarkable, that *Infusoria* still living, and not yet discovered at the surface of the soil near Berlin, are present among the fossil. *Gallionella decussata* and *granulata* are particularly mentioned.

According to Quekett, an infusorial stratum, of twenty feet thick, has been found underlying the city of Richmond in Virginia, which contains forms agreeing completely with the species found in the North Sea. *Navicula*, *Actinocyclus*, *Gallionella*, and others, are specified. (Ann. Nat. Hist. ix. p. 66).

A microscopical analysis, undertaken by Ehrenberg, of the natural paper-like mass found in Silesia in the year 1736, has given the following result:—That the chief part of the tissue consists of the *Conserva fracta*, in which nineteen species of *Infusoria* are imbedded (Bericht. über die Verhandl. d. Akad. d. Wissensch. zu Berlin, 1841, p. 225).

Stiebel has published his observations on the presence of *Infusoria* in Spas (die Grundformen der Infusorien in den Heilquellen, 1841).

An infusorial, living in the sulphureous waters of Harrowgate and Askern in Yorkshire, according to Lankester, would seem to be the *Astasia hematodes*, but he could not distinguish a tail, which is a generic character of *Astasia* (Ann. Nat. Hist. vii. p. 109).

Focke has declared the lowest invertebrata, namely, the *Monades*, to be too minute for physiological investigation. No explanation, therefore, can be given of these animals, either in regard of their generation or of their vegetable or animal distinction, or of the function of the parenchyma, and the like (Bericht. über die Versamml. der Naturf. u. Ärzte zu Mainz, 1842, p. 227). In the *Bacillaria* and *Navicularia*, particularly the *Navicula viridis*, Focke observed an evident open longitudinal cleft, through which it receives nourishment, so that no doubt can exist of the animal nature of this being; but, on the other hand, it was very difficult to distinguish it in the *Desmidiacea*, as they continued eight days, and longer, in the act of their transverse section, without essentially altering during this time. Besides the *Desmidiacea*, the *Diatomea* and *Closteria* have been also separated by Dujardin from the animal kingdom (Hist. Natur. des Zooph. p. 668).

In the contributions to the Fauna of the *Infusoria* at Vienna, published by Riess, 360 species are mentioned according to Ehrenberg's system (Beiträge zur Fauna der Infusorien um Wien, 1840).

Ehrenberg has accurately and ingeniously arranged, in his treatise, *Das unsichtbar wirkende Leben*, Leipzig, 1842, his previous important researches of many years, on "invisibly-working organic life."

The two following works, for which that of Ehrenberg has furnished the groundwork, are useful as hand-books. Kutorga: *Naturgeschichte der Infusionsthiere, vorzüglich nach Ehrenberg's Beobachtungen bearbeitet*, 1841; and Pritchard: *A History of Infusoria, Living and Fossil*, arranged according to "die Infusionsthierchen" of Ehrenberg, 1841.

R E P O R T
ON THE
PROGRESS OF PHYSIOLOGICAL BOTANY
DURING THE YEAR 1841.

BY
DR. H. F. LINK,
DIRECTOR OF THE ROYAL BOTANIC GARDEN, BERLIN.

TRANSLATED BY
E. LANKESTER, M.D., F.L.S.

R E P O R T

ON THE

PROGRESS OF PHYSIOLOGICAL BOTANY, &c.

ANNUAL REPORTS on the progress made in science, as first instituted by Berzelius for Chemistry and Physics, rank among the most useful of our scientific arrangements, provided three conditions are borne in mind. First of all, they must not be published too late, when the information is already known to the public, and, therefore, superfluous; and if such should be the case with the present Annual Report, let it be considered, that the unexpected death of the former reporter, Professor Meyen, occasioned an unavoidable delay. It is always better to make up, in individual matters, than to publish all too late. The second condition is, to give, as far as possible, a faithful report of the statements of the author, without mingling them with the opinions of others. It appears also preferable to me, to pass over a work entirely, rather than to pronounce it at once as insignificant. It is at times necessary to introduce the author verbally, in order to exhibit the manner in which he has instituted his observations. But this is not always practicable, and it is frequently very difficult to represent the views of another faithfully, because many authors have not the ability to express themselves in definite, and therefore in distinct terms, a deficiency which particularly betrays itself by the use of too many words, used in order to avoid the necessity of stating, that they are not yet acquainted with a

certain matter, or that they have committed an error, or that they have not yet a distinct view of the subject. The more inexperienced we are in a science, the more apt are we to suppose ourselves perfect in it, and the less are we inclined to confess that we have been mistaken. Finally, it is unsuitable to make controversy a principal object of an annual report, or to conduct it in an irritable and hostile spirit, or to quarrel and dispute, when nothing can be said against the principal matter. The Anatomy and Physiology of Plants has been very much exposed to such contentions, and a progress of their knowledge has been rather impeded than facilitated by them. My predecessor in this work, can, by no means, be absolved from the reproach of a contentious disposition; I shall, however, endeavour to avoid imitating him in that respect.

INTERNAL STRUCTURE OF PLANTS.

WE find a treatise on *the Internal Structure of Plants in general*, in the *Annales des Sciences Naturelles*, second series, volume xiv. p. 16, 17, under the title of—"Etudes Phytologiques, par le Comte de Tristan. Prem. Mem. de la Nature des tissus Végétaux." The author commences with the question, whether the tissue of vegetables is homogeneous or not. With this view he contemplates the transverse section of the stem of any plant—for instance of the Poppy (*Papaver somniferum*); and further, of the petiole of the leaf, as of *Cucurbita maxima*, and finds therein a double tissue. The first occupies the greatest part of the stem or petiole, and clearly consists of cells; the second surrounds the vascular bundles. The latter, however, do not always exist, but the tissue also occurs without them. He now follows the fine fibres of the latter, as far as the ovary, and finds, that it only exhibits itself there in bright spots, in which no organization is perceptible. Spiral vessels are only subsequently produced in the axis of these fibres. The "clear" unorganized substance he terms cambium, and says

of it, that it may have exuded from the first tissue, but that it is not homogeneous with it. In this respect he distinguishes the second tissue from the first; and since the cells of this first tissue resemble foam, being only more consistent, he terms the first tissue "aphrostase;" the second, because it accompanies, and, as it were, conducts the vessels, "hegemon." A division, or fissure, which he calls "cunice," separates, in trees, the bark from the internal part, or from the "endophyte" as he terms it. The inner part, however, does not consist of a single part, but of the pith, and that which is called wood, but which does not always deserve this name, as it is frequently very soft in herbs. The author therefore terms it "endostere," because it is at all events firmer than the surrounding part. He now proceeds to examine the origin of the so-termed "prolongemens medullaires," and says of them, that they originate from the "tissue aphrostasien," that they also continually get smaller, and that the vascular bundles which have grown up, thicken, at last only leaving a trace of them. He therefore terms them "isthmes aphrostasien," or briefly "isthmes." The consideration of a transverse section in the stem of a bramble (*Rubus fruticosus*) leads him to the adoption of a third tissue, which he terms "proxyle," distinguishing it by the circumstance, that it consists of prismatic or cylindrical fibres (filets) of an indefinite length. He examines it from its first origin, and finds that it also consists at first of a cambium, so that each of the three tissues has its own peculiar cambium. These tissues are very often intermixed, and he terms such a mixture, which is produced from an effusion of the cambium "proxylaire," into another already formed tissue, an "adelome." These are the principal contents of the treatise.

It is gratifying to see, how an observer, without regarding that which others have done before him, nevertheless hits upon the best arrangement. The three kinds of cellular tissue, as determined by the author, certainly deserve to be distinguished. The first is that cellular tissue (called "aphrostases" by the author), which constitutes the basis of the whole stem, or rather of the whole plant, and which always

consists of parenchyma, and is forced together in the stem by means of the growing woody bundles (*holz-bündel*); and medullary rays (*prolongemens medullaires*) are formed, which the author very correctly defines, and not unjustly terms, "isthmes." The general term "hegemon," for the cellular tissue, which accompanies the vascular bundles, and which mostly consists of parenchyma—at times, also, however, of long, narrow, parenchymatous cells—is likewise very proper. The third cellular tissue of the author, the "proxyle," has already received the name of liber. The Greek appellations of the author are, however, bad enough, — "Aphrostase" means position of foam; "hegemon," a leader; "proxyle," anterior wood; "adelome," concealment. The French always used to ridicule the technical terms of our learned men as proofs of their pedantry; we might now, I think, justly return the compliment. In German, we might term these tissues Grund-gewebe (fundamental tissue); Begleitendes-gewebe (accompanying tissue); and Bast-gewebe (liber tissue.) That the author only saw an inorganic matter in the so-termed cambium, probably was owing to employing too low a magnifying power

With this I beg to combine the announcement of a treatise, which struck me very much, and which partially belongs to this subject:—"Etude Microscopique des Précipités et de leurs Métamorphoses appliquée à l'explication de divers Phénomènes Physiques et Physiologiques, par P. Harting. V. Bulletin des Sciences Physiques et Naturelles en Neerlande. Ann. 1840, p. 287, 365." The author has analyzed a number of precipitates, formed mostly with inorganic substances alone, very few of them with organic and inorganic substances together. The first kind of precipitates, according to our author, are the *crystalline*; and he asserts, that crystallization is an original act. The second kind are the *molecular*. Their form cannot be ascertained, because the corners or angles, in the small granules, cannot be recognised beyond a certain boundary. The granules unite themselves to irregular or flocculent masses, and the molecular motion ceases as soon as this is effected. The third kind, the *membranous* preci-

pitates, are in many instances produced immediately; at first they are flexible, become, however, brittle afterwards, and are changed also into flocculent masses. The fourth and last kind, are the *gelatinous* precipitates. Thus far the subject, properly speaking, does not belong to our department. The author, however, proceeds further. He reduces the molecular movement to an attractive and repelling power, and applies this to the movement of the granules in the cells, which he says may be explained in the same manner, even though it is assumed that the movement depends on the walls of the cells. He refers to the statement of Schwann, with regard to the manner in which the cellular bodies arrange themselves around a granule, and finds a similarity in the manner in which the granules form themselves in the precipitates. He carbonized pieces of an onion, the cells of which contained nuclei, and found the nucleus destroyed; but is still of opinion, however, that this negative result does not prove any thing. Carbonized parts of plants, it is well known, retain their original form, and the author therefore inquires, whether the formation of the homogeneous organic members may not be considered as a membranous precipitate of substances, which are usually termed inorganic.

In the present year (1841) I have published a small treatise respecting the solidity of bodies, with the view of directing the attention of natural philosophers to this subject. I have seen, and proved it to several eminent natural philosophers, that all precipitates, when analyzed immediately after their formation, exhibit globules; that these globules unite themselves to larger ones (being therefore fluid, like globules of quicksilver); and that these united globules or drops, subsequently only (and that frequently under our own eyes) change themselves into crystals. If M. Harting did not observe this, it was owing to his not having examined the precipitates speedily enough. The globules sometimes form flat surfaces, sometimes they are gelatinous. I have repeated, in this small treatise, what I have before stated, that all fluid substances exhibit a commencement of solidity on their surface—for we attribute fluidity to a substance, if the parts can be displaced from each

other by the slightest application of force; and this can only be done, when the attracting and repelling powers of the homogeneous parts neutralize each other, which cannot be the case on the surface of fluid substances, where the parts are 'unequally drawn in different directions. This solidity increases with the surface, and a thin stratum of fluidity is consequently in itself solid. The degree of solidity certainly depends on the degree of attraction among the parts, which, as is well known, is different also in fluid substances, as exhibited by quicksilver and water. Nothing, therefore, is required, for the production of a membrane, but the separation of a stratum of fluidity, as every bubble shows. The half fluid substances, mucus, jelly, &c., are a mixture of solid and fluid parts, as can be seen when they are dried, and it is saying nothing, to say we have derived a solid substance from mucus. Nor is it by any means necessary, that a fluid substance should have to pass through a state of half fluidity, in order to become solid—as a proof of which, we may adduce the crystals of salt. If we admit attracting and repelling powers to act at pleasure, as M. Harting has done, a good deal may certainly be explained; but we must divest our explanation, as much as possible, of arbitrary assumptions.

We have received many researches this year respecting the *chemical constitution of cellular tissue*. First, Some observations respecting the colouring blue of the vegetable cell-membrane, through means of *iodine*, by Hugo Mohl. *Flora*, 1840, p. 609. In consequence of Schleiden's observations, the author instituted researches regarding the embryo of *Schotia speciosa*. This embryo swells by a lengthened maceration in cold water, and by boiling with water, but is not entirely dissolved; and then, not only are the cells coloured blue by the application of iodine, but also the mucus around them. The cells of the cotyledons of *Tropeolum majus*, *hybridum*, and *minus*, exhibit a similar reaction. The blue colour with them, however, does not appear immediately, but the cell-membrane first turns yellow, then green, and finally blue. The cell-membrane of many lichens was likewise analyzed, after Meyen's suggestion, and a similar reaction was

observed.* The effect upon the *Algæ* was much slighter, and only *Sphærococcus ciliatus*, *Ulva linza*, and *U. lactuca*, assume a blue colour. The author further instituted researches respecting the horn-like albumen-cells; *first*, of those of *Monocotyledons*, when he found the four following principal modifications:—*a.* Albumen-cells, which are coloured yellow by diluted tincture of iodine, becoming yellowish-brown upon being dried, and which assume their former yellow colour again on being moistened, and which, in fact, behave themselves in quite the same manner as the common woody tissue. This takes place, as far as the author investigated, with the albumen of all Palms, for instance, with *Rhapis acaulis*, *Manicaria saccifera*, &c. *b.* Albumen-cells, which exhibit first a yellow, subsequently a brown colour with an admixture of violet, upon the action of iodine, which become clearer or darker yellow-brown upon being dried; and upon being soaked again, become violet, with a brown admixture; as *Iris pratensis*, *atomaria*, *Allium globosum*, *odorum*, *sibiricum*, *Asphodelus luteus*, *Anthericum ramosum*, *Czackia liliastrum*, *Eucomis punctata*. *c.* Albumen-cells, which, upon the action of iodine, become first yellow, then brown, finally dirty violet; when dried, red-brown; when soaked again, violet, with a partial transition to deep violet blue; as *Iris aurea*, *Asparagus dauricus*, *maritimus*, *Scilla peruviana*, *Hyacinthus romanus*, *amethystinus*, *Lilium bulbiferum*, *Tigridia pavonia*, *Convallaria racemosa*, *Yucca gloriosa*. *d.* Albumen-cells, which, by the application of iodine, are coloured with a lively violet; when dry, red brown; soaked again, beautifully violet or deep violet blue. *Ixia hyalina*, *squalida*, *Gladiolus tristis*, *Ruscus racemosus*, *Veltheimia viridifolia*. The author has investigated, with less care, the seed of *Dicotyledons* with horn-like albumen, because the phenomena, as far as he observed them, were the same as in the *Monocotyledonous* plants. Caustic potass acts, according to the author, veryconsiderably upon those albumen-cells which become coloured blue by the application of iodine. Those upon which the alkali acted most slightly, were furnished with considerably thicker walls. It was distinctly

seen, that the external strata of each cell were first loosened into a gelatinous mass; and the cells, situated at the edge of the section, were entirely converted into a jelly, soluble in water. The dissolved substance, as well as the loosened membranes of cells, were beautifully coloured blue by iodine. The author next remarks upon the effect of iodine upon the cell-membrane in general, and draws the following inferences:—

1st, The iodine imparts very different colours to the vegetable cell-membrane, according to the quantity in which it is taken up by it. A slight quantity of iodine produces a yellow or brown, a larger quantity a violet, and a still larger quantity a blue colour. Iodine imparts the yellow or brown colour to the dried membrane of the cell, provided it is dissolved in alcohol, or otherwise comes in contact with the latter; the violet or blue colour, on the other hand, only takes place when the cell-membrane is soaked in water. The blue colour converts itself into the violet or red brown upon being dried, but resumes the former colour on being again moistened; analogous changes of colour, as is well known, also take place with the iodine of starch, according to the circumstances of the latter being dry or wet.

2dly, The colour which the cell-membrane assumes through means of iodine, does not only depend on the quantity of iodine applied, but also on the quality of the membrane itself. The more soft and tender membranes, which swell readily in water, assume immediately a violet or blue colour, even when only a small quantity of iodine has been applied to them; or the yellow colour, which they at first assumed, passes into a violet or blue colour, even before the fluid has completely dried up; or, at all events, immediately after, and resumes it again on being soaked. The more hard, brittle membranes, which less readily swell in water, on the other hand, on the application of iodine, assume a yellow or brown colour; and, after being dried and soaked again, assume a blue colour, when a large quantity of iodine has acted upon them.

Third, This development of a blue colour entirely depends on the nature of the membrane of the cell, and is only produced by the addition of a sufficiently large quantity of iodine.

Schleiden has published an Appendix to this Treatise, in the same annual series of the Flora, p. 737. He is of opinion, that Mohl might have drawn two conclusions from his researches:—1st, That iodine has no influence as a reagent upon starch, which indeed is the result of the discovery of the amyloid. Schleiden, together with Vogel, has found a substance in the cotyledonary cells of *Schotia latifolia*, *speciosa*, *Hymenæa courbar*, &c., which assumes a blue colour on the application of iodine, but in a different manner from starch; and he has published this in Poggendorff's Annals for 1839. 2dly, That the blue colouring of vegetable substances, by iodine, is no real chemical combination. Mohl has said, that the blue colouring of the membrane does not indicate a material difference from the ordinary membrane of the cell, on account of its not being probable, that cells formed of a different substance, should occur together in the same plant; but with regard to this, the reporter replies, that the only point of importance, is the question of what is understood by the essential difference of two vegetable substances. Mohl seems inclined to leave this point to the chemists, but is however of opinion, that in that case we should have to wait some time. This is followed up by a remark, which deserves to be inserted here, as it marks the peculiar manner of Schleiden. "On reading the good-for-nothing opinions of Berzelius and Liebig, respecting Schwann's discoveries with regard to the (*Gährungspilz*) fungus of fermentation, one would suppose that these gentlemen had never heard of such a thing as a microscope. On hearing Berzelius speak of Schwann's frivolousness, we do not know what to say to such absurdity. I should sincerely congratulate the science of chemistry, if Berzelius had always instituted his researches with a circumspection so thoroughly founded upon elaborate knowledge, and a profundity, combined with so much modest doubt in his own powers, as to secure him from the influence of preconceived opinions, as Schwann has done.* Did not

* Schwann has written a book, called "Microscopical Researches on the Identity of Structure and Growth of Animals and Plants"

the first hundred pages of the sixth volume of his chemistry occur to Berzelius when writing these words, and produce a blush of shame in him for such a judgment?"

The author then proceeds to the chemical qualities of many vegetable substances, and draws the following conclusions therefrom; which I will enumerate verbatim, in order that they may be understood:—1st, "The vegetable substances, which are usually enumerated as indifferent ones (*amphotere*), and which belong to the series of starch, form only a very scanty selection of the infinite variety of materials, belonging to the same degree of development, which occur in plants. 2dly, The plant forms a chemical elementary matter in its vegetation (no allusion is meant hereby to the old nonsense of primitive mucus), which remains the same, in all stages of the process of vegetation, with regard to its elementary composition; but is, however, capable of infinite modifications, owing to internal changes, which are imperceptible, and altogether unknown to us, partially, also, to the increase and diminution of the water combined with it; the number of which depends on the number of atoms of water which associate themselves with it, and also on different combinations of elements, but which, for the present, appear to us as a constant series of different states, the nearest members of which do not appear to us to differ materially. The lowest of these members is sugar, the highest the perfectly developed substance of the membranes,—a series, the members of which become more insoluble in water as they rise from below upwards, so that, under certain circumstances, the gelatine from the cellular substance crystallizes from without in an organic form." (See Schwann's *Microscopical Researches*, &c., p. 220.)

It appears to me very advisable, however, to have recourse again to the chemists.

There is a report of a treatise of M. Payen "Sur la Com-

(Berlin, 1839); in which he adopts Schleiden's opinion with regard to the cytoblast, without any further scrutiny, and now endeavours to trace a similarity in the animal kingdom. Respecting it, see my *Propylæen of Natural History*, Berlin, 1839.

position *Chimique du Tissu Propre des Végétaux*," in the *Annales des Sciences Naturelles*, vol. xiii. p. 305.

The reporters are, Dumas, Pelouze, and Ad. Brongniart. Payen caused caustic potass in a heated state, then iodine, and occasionally sulphuric acid, to act upon different vegetable substances, and observed, that the original membrane, which constitutes the integuments of the cells, remained without any change. He found, on the other hand, that the deposits on this membrane converted themselves into a substance under the action of potass, which, on application of iodine, assumed a violet colour (blue-violet); and that, finally, a part of these new products, which he terms secondary ones, were converted by the same influences into another substance, which assumes an orange colour on the application of iodine. It appears, further, from his numerous analyses, that the vegetable tissues, both of the *Phanerogamia* and the *Cryptogamia*, by the continued solution of all foreign substances, which have either been deposited in their cavities, or on the membranes themselves, may be traced to a substance (cellulose), which constitutes the original walls of the cells of the cellular tissue, of the woody tissue, and of the vessels, which has the same composition as starch, and is only distinguished by its aggregated state, through means of which it exhibits a stronger degree of resistance to chemical influences. The similarity of the cellulose and of starch, with regard to elementary composition, the transformation of both substances into dextrine and sugar, would, indeed, in themselves, lead us to suppose, that intermediate states exist. In fact, the author observed, that the membrane of the *Cetraria islandica*, when properly cleansed, assumes a blue colour on the application of iodine, and is dissolved like starch in soda. The thick walls of the cells in the albumen of *Phytelephas* and *Dracæna* likewise, when properly cleansed, assume a blue colour on the application of iodine, but resist solution longer than the cellular substance of the *Lichenes*. The reporters add:—Cells of woody tissue, when freed from all foreign substances, so as no longer to assume a black colour on the application of muriatic acid, and of weak sulphuric acid; nor an orange colour, on the

application of iodine, still retained some thickness,* but had become soft and spongy; and this was also the case with the dots and stripes (*linéaments*) which do not disappear. They are of opinion, therefore, that the deposited substances are not only deposited externally, but have also penetrated into the internal structure of the tissue.

An elaborate treatise, on this subject, by M. Payen, is published in the same Journal, vol. xiv. p. 73, being the results of elementary analyses of the cellular tissue of various plants. These were:—The ovule of the kernels of almonds, pears, and apples, and *Helianthus annuus*, the membranous part of the cambium of cucumbers, the cellular tissue of cucumbers, the pith of *Sambucus nigra*, of *Æschynomene paludosa*, cotton cleansed once, and cotton cleansed twice, the spongioles of roots. The analyses fluctuate between 43 and 45 parts of carbon in 100; 6.04 and 6.32 hydrogen; and 48.55 and 50.59 oxygen. The formula of $C^{24} H^{18} O^9 + H^2 O$ corresponds with these analyses. Other researches are added to this. Leaves were, with difficulty, freed from a waxy substance, but at last gave a cellular substance of the same composition as the former. Spiral vessels of *Musa sapientum* evidently contained a covering, “*matière incrustante*;” for, only on being cleansed by the application of ammonia, water, weak muriatic acid, &c., did they give 0.484 carbon; on being treated by potass with heat, only 0.44 carbon; the latter had otherwise the same proportion as the normal cellular tissue. The pure membrane taken from the grains of wheat had the usual constituents. The cells in the circumference of the albumen exhibited a grey colour, which originates from a gelatinous substance that covers the membrane. The application of tannin colours and contracts this substance, ammonia and acetic acid dissolve it, and leave the pure membrane; solution of iodine colours the gelatinous substance yellow, the starch dark violet, and leaves the membrane uncoloured. There remains in the grain only pure membrane after germination. Vegetable remains, from cow dung, were easily cleansed, and the membrane then had the usual composition. The hair of the seed of the Virginian Poplar Tree

behaved in the same manner as cotton. It was difficult to separate firwood from all foreign substances; the membrane, however, after this had been accomplished, exhibited the usual composition. The membrane of *Cetraria islandica*, cleansed by water, alcohol, ammonia, acetic acid, and ether, still assumed a blue colour on the application of iodine; and the jelly of this lichen contained hydrate of starch and inulin. This last substance is resolved into a sugar by acetic acid, which is dissolved in water, and also in alcohol. On dissolving inulin in boiling water, it is separated, when left to cool, into small, white, and transparent globules, like starch globules; they do not, however, assume a blue colour on the application of iodine. The albumen of dates may be entirely dissolved by potass, in the same way as the membrane of *Cetraria islandica*. It was more difficult to remove deposited substances from the *Confervæ* and *Chara hispida*; precaution was necessary with the *Fungi*; but a membrane of the usual composition remained in all these cases. The author describes different forms of starch granules in the *Chara*; but they were not different in a chemical point of view. The tender membrane in the orange coloured organs of the *Chara* exhibited the usual composition of vegetable membrane; the substances contained in it, however, were very nitrogenous. The author expresses the opinion, that all nitrogenous materials in plants, are only deposited, whilst they penetrate into the membranes themselves of animals. He obtained the prepared gut of a sheep, from a manufacturer of stringed instruments, treated it with water, acetic acid, and potass, of which the two latter had a peculiar dissolving effect, analyzed the remainder, and found a nitrogenous quaternary compound. This residue had also, in other respects, the general qualities of animal membrane; it dissolved in acetic acid and diluted muriatic acid, which is not the case with vegetable membrane. The author compares the distinguishing marks of pure vegetable and animal membrane; and, besides the one enumerated, I may add, that the latter is dissolved by the diluted solutions of potass and soda, and ammonia, but not the former. Further, that tannic acid, alum, and corrosive sublimate, do not

act at all, or at all events only in a trifling degree, upon the former, tannic acid contracting it a little; the latter, however, is not only contracted by it, but combines with it.

This excellent work presents decided answers on many disputed points.

I may here be permitted to add something respecting the starch in plants. I have illustrated the changes of the granules of starch in the 16th Table of the *Icones Anatomicæ Botanicae*. The granules of potatoes were burst by warm water, and yielded a thick fluid mass, which assumed a blue colour on the application of iodine, the same as the enclosing integument. It follows from this, that each granule of starch contains a thick fluid kernel, as Raspail asserted, although the integuments consist of many layers, as may indeed be distinctly seen in many granules of starch, just as Fritzsche first observed. As this thick fluid kernel assumes a blue colour on the application of iodine, like the integument, there is no reason to doubt that it consists of any thing else than a mass of amylum. It is an ordinary occurrence, that this mass is changed into gum or dextrine, by being strongly heated, or by a lengthened rubbing with water, as Raspail applied it, and a similar transformation takes place on the more usual application of nitric acid. The experiment should be performed as soon as the bursting has taken place, in order to avoid any change occurring in the starch. The integument of the granules is frequently found torn after germination; see fig. 9 and 10 of the same table, compared with fig. 8. Unformed thick fluid starch I first found in the bulbous-formed roots of *Salap*, subsequently also in the bulbous-formed roots of the common *Orchis latifolia*, before and after blossoming, as is seen in fig. 13 of the same table. Later, I also found amylum in the roots of *Orchis pyramidalis*, and in the roots of *Orchis latifolia*, long after blossoming. As usual in granules, Roots of *Salap* are also met with, that contain granules of starch. It seems, therefore, that the unformed matter is capable of transforming itself into granules. A thick fluid mass, which cannot be coloured by iodine, mixed with large granules of starch, is also found in the seed of *Phascolus*

vulgaris, fig. 12. Large and small granules of starch are generally mixed with each other. The most external cells of the grain of wheat, in which, according to Payen, the most gelatine is contained, contain small granules of starch, as if they were developed from gelatine. Mohl, I think, was the first who observed that starch develops itself in chlorophyll; it may be observed, with peculiar distinctness, in the older leaves of the *Vallisneria spiralis*, where a granule of starch is produced in the granules of chlorophyll, as may be perceived by the application of iodine. It is remarkable, that the movement of the chlorophyll granules immediately ceases, as soon as a granule of starch has formed itself in them.

Vegetable substances are by no means so uniform as the mineral substances. Saltpetre is saltpetre, and common salt common salt, let it be prepared in what way it will, if it has only been properly cleansed. This is not the case with many vegetable substances—for instance, with alcohol, the vegetable acids, &c. In others, this chemical universality, if I may so term it, is not so great as is seen in sugar. The vegetable substances, indeed the organic substances in general, only form genera and species in most cases. Thus the etheric oils are different in every kind of plants, and this is also the case with the isomeric compounds; also with the resins and gums; and although they have but five distinguishing characters, yet they differ in their qualities in almost every plant. This is also the case with starch, for although it has the same characters from wheat, potatoes, and from arrow root, yet the jelly obtained from them exhibits differences. Potato starch, for instance, has a peculiar smell. In this instance, therefore, as indeed is done generally in natural history, we reduce the species into genera, which we distinguish by certain marks; and thus every thing is called starch, which presents itself unformed or in granules, that assumes a blue colour on the application of iodine, and that is dissolved in warm water; and not in spirit of wine, ether, and oils. The *Althæa mucus* also, at least partially, belongs to the genus starch; it forms granules, which become blue on the application of iodine, which dissolve themselves in cold water, and which

form a mucus that is likewise turned blue by the tincture of iodine. See *Icon. Anat. Bot.*, table 16, fig. 14, *a. b.*

It is a matter of surprise to me, that Payen has paid no regard to the cellular substance of potatoes, which seems to approximate to the membrane of the *Lichenes*. As to *Cetraria islandica*, it behaves itself as I have represented in the third volume of the selected *Anatom. Bot.* Figures, table 5, figs. 1 and 3 (1841). The most external layer, which generally consists of an intercellular substance, does not become coloured by iodine; the second layer, consisting of very tender close tubes, exhibits a strong colouring by iodine; and again, the most internal, very loose layer, which consists of larger tubes, is not changed by iodine. It is different with *Lobaria pulmonaria*, and *Roccella tinctoria*; the external layer does not become coloured, but the internal, very loose layer, consisting of rather thick tubes, does; the second layer, which is coloured blue in *Cetraria islandica*, is also entirely wanting here. See table 5, fig. 13, and table 6, fig. 5.

The production of new cells, in relation to those already existing, may be conceived to take place in three different ways. The new cells are produced at the ends, edges, or within the circumference of the older cells; or they are produced between the older cells; or they are produced within the old cells, by a mother cell being torn, or otherwise destroyed, which causes the new cell to come forward. The last mode of production is assumed by Schleiden, who describes the new cells as produced from a dark nucleus "cytoblast" (which R. Brown has particularly observed in the young cells of the *Orchideæ*) within a mother cell. I have made some researches on this subject, and the result of them I have given in the second volume of the *Icones Selectæ Anat. Bot.* (1840), tab. 6, figs. 1-8. The young leaves are most easily investigated in juicy plants; the bud is only a round projection of the trunk, on which the leaves are situated like small granules. Fig. 1 represents such a leaf of *Sempervivum arboreum*, magnified 315 times in diameter; and fig. 2 exhibits the point of such a leaf, magnified 600 times. A dark material is perceived in the cells of fig. 1, which is less distinct in the cells of

fig. 2, which, however, in the final papilla, seems to be bound into a sac. This papilla disappears when the leaf begins to grow. The projection of the trunk itself, with the young leaves or the bud, is found in fig. 4, magnified 100 times; and in fig. 3, magnified 180 times. There is scarcely any foreign matter perceptible in the leaves, but a granule is certainly found in the projection of the trunk, which afterwards disappears; no trace of cells is, however, found any where one within another. If we were to call the entire young leaf a mother cell, in as much as it may be surrounded by cuticle, this would be a mere quibble, since this little skin is torn and disappears, and thus allows the cells to come forward; indeed, the individual cell distinguishes itself from the skin of the leaf, by the former enclosing no other cells than that of the latter. Fig. 5 exhibits a young bud of *Quercus robur*. It exhibits just the same structure as the juicy plants, a projection of the branch furnished with leaves, the only difference being this, that it is curved in this and straight in that. Cells, 780 times enlarged from the projection, are seen in fig. 6. The green substance, chlorophyll, is exhibited distinctly, of a pale green colour; but one cell within another is nowhere to be seen. All this is confirmed by the representation of a bud of *Syringa vulgaris*, which would only have developed itself in the following year. As young cells are never perceived, therefore, in the interior of the old cells, we have reason to assert, that an enlargement of the cellular tissue, by means of mother cells, does not take place in these plants.

A preliminary answer to H. Mohl's treatise, respecting the structure of the annular ducts, by Dr. M. J. Schleiden, is found in *Flora*, vol. xxiii. p. 1. It is necessary, however, to go back as far as the year 1839; partly in order to understand the subject in general; and partly because Meyen's representations are very defective. The same author has published observations in the same journal, respecting *spiral formations* in the cells of plants. The cells of plants, he states, inclusive of the so termed vessels — but setting aside the latex ducts — exhibit two periods in their life. In the first period, which

is the period of their production and isolated independent development, the membrane forming them, grows in its whole substance through intussusception. As soon, however, as the cells have joined the cellular tissue as the constituent matter of a certain plant or its parts, that kind of growth ceases, or, at all events, retrocedes very much. But a new and important circumstance is now added to the other phenomena, namely, that a new layer is deposited upon the whole internal surface of the wall of the cell, in the form of one or more bands, closely twisted together, so that the spires exhibit the most exact contiguity without any continuity among themselves. Originally, such is the opinion of the author, two bands existed together, arising from an ascending and descending current of the formative matter. The author first of all contemplates the case, when the cell has not attained its perfect development, at the period when the thickening of its walls commences through means of spiral deposits. We find here the following cases:—*a.* Simple fibre (double in the sense stated above). The cell extends itself considerably from the moment of its production, individual spires grow together early, and others become disunited and form annular ducts. The author subsequently expresses himself more distinctly, by stating, that this laceration or separation takes place by means of resorption. *b.* Simple or manifold fibre, with an extension of the cell, and slight or no connection with the wall of the cell. Spiral vessels, capable of being unrolled, with wide spires. *c.* Simple or manifold fibre, with a more considerable extension of the wall of the cell; which are generally closely grown together. Narrow spired (not?) spiral vessels, that are capable of being twisted, false tracheæ, and partially banded and scalariform vessels of the older writers. *d.* Manifold fibre, with moderate extension of the cell; particular portions of the spire grown together; generally, also, they adhere to the wall of the cell. The entire series of forms, from the so termed branched spiral, to the reticulated vessels. A portion of the banded and scalariform vessels of the older writers also belong to this division. The author then proceeds to the second case, stating:—If the cell, however, has already

attained its perfect development at the period when the spiral deposits commence, a new and most wonderful circumstance takes place, namely, the formation of air vesicles on the outside of the cell, between two adjacent ones, which precedes the production of the deposits, and the spires in the inside at the locality, which corresponds to the place of those air vesicles, separate themselves from each other in the shape of fissures. All porous cells and vessels belong to this division; likewise, however, a portion of the former banded and scalariform vessels, which are only distinguished by the length of the slit of the pore, from the so termed porous vessels. The author further alludes to the differences of the cells as to form, which pass from the small globular to the very lengthy form. The vessels, according to his opinion, are produced by the intervening walls of the cells being absorbed; he also says, that the perforation of the primary membrane, in the leaf cells of sphagnum, is produced by resorption. The author likewise adds, that it is not always only a single deposit that remains, but several repeated, and in such a manner, that they either lie one upon another, by which the broad plates in the sphagnum cells are produced; or when this does not take place, as in the pores of *Taxus baccata*. Previous to this, appeared a treatise by H. Mohl, in the same Journal, vol. xxii. p. 81, respecting the structure of the *vegetable cell membrane*, which is particularly directed against Meyen's opinions; and, among others, against the opinion, that the membrane of cells is formed of spiral fibres. In this treatise, he also maintains the opinion, that the fibres and punctations of the cells originate from a deposit of a secondary, upon the external membrane, in many cases even from a tertiary membrane. He believes, the process of formation of the simple, particularly of the secondary cell membrane, is governed by the rule, that the organic substance is not deposited perfectly uniform, but is deposited in some places in larger, in others in smaller quantities; and it is when this unequal deposit occurs at some places in larger quantities, and is entirely wanting between the deposits, that these large deposits either (particularly in lengthened cells) take place in the direction of a spiral, or

(especially in shorter cells) in the direction of the fibres of a net. There is another treatise in the same volume, p. 673, by *H. Mohl*, respecting the annular ducts, directed against Schleiden, who asserts (as already mentioned), that annular ducts, which are capable of being unrolled, were formed from the basis of spiral vessels, the fibres of which have grown together from two spires which have become closed, and which subsequently become isolated by the resorption of the spiral formed portions of the fibres that are situated between. *H. Mohl* observes,—“ I have explained the reasons in the treatise respecting the vegetable cell membrane, which are in favour of a fibrous structure, belonging to those secondary cell membranes, that are distinguished by stripes; and by a greater degree of capability of tearing or separating themselves in a spiral direction; and by depressions and furrows, which extend themselves through the entire thickness of the membrane of the cell; and, in a still higher degree, by fissures.” He considers the structure of the fibre, which forms the annular ducts, to be quite analogous to the structure of the spiral fibre, and shows, that (especially where the rings are situated near to each other), in the lines of division, shallow or deeper furrows exhibit themselves, which are quite parallel to the edges; and that (where they are more removed from each other) a regular spiral fibre runs between them in other cases, which either connects itself with the rings or not. This representation alone must cause a doubt with regard to Schleiden's theory. A principal reason, however, is the examination of *Tradescantia tuberosa*, to which Schleiden refers, especially of the roots, where (in the first states in which the fibres exhibit themselves) they have already the same differences of form, viz.:—Annular and spiral fibres, as in the subsequent states. This is followed by the preliminary answer of Schleiden, to which we have alluded in the commencement. He states, that he does not believe that he has been mistaken in his observations, but that he has seen real stages of transition, as the stationary rings are distinguished essentially by sharpness of delineation, firmness, and clearness of substance, from the yellowish jelly-like transitional matter of the spiral, which is

already partially destroyed at the edges, and in the act of decomposition. Some of the annular fibres, with spiral fibres of Mohl, he considers to belong to the reticulated tissues. He states,—“ Generally speaking, I am inclined to pronounce the inference from the developed forms, upon the history of the production, as very dubious, for it cannot have escaped the observation of Mohl, that secondary fibres, in very many cases, develop themselves as links of connection, subsequently to the formation of the fundamental spirals; and which fibres, although consisting of quite a different substance (because they are soluble by being boiled in caustic potass), are apparently not different from the spirals, and thus renders the recognition of the fundamental spiral exceedingly difficult.” He is inclined to attribute such a secondary mode of connection to one represented in Mohl’s figures. Schleiden says, at the conclusion,—“ The reason that particularly induces me to persevere in my views, is the philosophical necessity, inseparable from the genuine investigation of nature, of limiting the number of modes of explanation, so long as a new reason is not absolutely required, in consequence of the impossibility of explaining a phenomenon by an old mode of interpretation.”

Herr Schleiden’s theory, respecting the spiral formations in plants, is a hypothesis. The explanation of the different forms of these formations, out of the relation of their production to the increment of the cells, is very ingenious and convenient, if it could only be proved to be true. But there appears to us to be a fictitiousness about the wonderful air vessels, which are to constitute fissures and pores, and no other investigator has observed any trace of them. A number of questions might be put in objection to this view, as, for instance, How can air bladders produce regular formations, and how is it that they do not act equally upon both sides? Whence come these air bubbles? It is not probable, that vessels can be produced from the absorbed walls of cells, as it is in their young state that they do not present walls at all. The author is fond of attributing effects to resorption. He probably intends to say “ decomposition,” fusion, or something of that kind, for we know of no re or absorbing vessels

in the vegetable kingdom. Schleiden is right, when he says, that it is a genuine philosophical principle, to limit the number of explanations, provided the reasons existing are sufficient. Thus Newton applied this doctrine, by stating, that the movement of the heavenly bodies did not require any other explanation than the one given by him. But it would, indeed, be unphilosophical to carry this doctrine so far as the author. For how can any one admit the impossibility, in experimental sciences, of explaining an experiment, according to an old theory, when one is bold enough to create hypotheses; such, for instance, as has been done here about a deposit in spirals. Such a doctrine would be very acceptable to M. Dutrochet and the mechanists.

Herr Schleiden mentions my former opinions respecting the spiral formations in plants, at the commencement of his treatise, in the twenty-second volume of the *Flora*, with a view to pronounce them incorrect. He is perfectly right there, for I myself have found them to be incorrect. He further says:—"Link is still far from understanding all the facts connected with Botany, and unable to arrange them from a correct point of view, as is seen in his newest edition of the *Philosophia Botanica*." He may likewise not be wrong there, for I am far from being so conceited, as to imagine that I have perfectly understood nature.

We have not enumerated, above, a slight controversy which took place between Mohl and Schleiden, respecting the right and left directions of the spiral fibres, because Schleiden renounces his opinions at the commencement of his preliminary answer, and even accuses himself of thoughtlessness.

Mohl says (*Flora*, vol. xxii. p. 676), "No doubt can be entertained by any one, who has investigated the development of the spiral fibres and the spiral cells, and who has recognized the decided analogy between these two formations and the dotted cells, that the fibre of the spiral vessels is no peculiar formation, existing by itself, but that it must be considered as the secondary membrane of the vascular sac, which has a spiral direction, and is divided into one, or into several parallel bands." I beg to ask, Was the membrane

connected in its first formation, and did the separation into fibres only take place subsequently? I shall demand proofs if this question is answered in the affirmative; and if in the negative—if the fibre is assumed to be separated from the membrane immediately at its first formation—I shall then ask further, What difference is there in saying, the fibre is a peculiar independent tissue; or, a membrane is peculiar, and primitively separated into fibres? The word “depositing” does not explain any thing; on the contrary, it has the improbable unproved meaning, that the formation of the fibre and of the membrane was a mere act of precipitation.

Even when the fibre is pressed rather flat, it has no similarity with the parts of a membrane; for, on magnifying 1500 times tissue from very young roots, the tender fibres of the spiral vessels may distinctly be seen rounded on the edges. The enclosing external membrane at that period is so tender, that it cannot be perceived. I should like to reverse the matter and to say, Whoever investigates the development of spiral vessels and of spiral cells, must acknowledge the fibre to be a peculiar independent formation. With regard to the pores, I am of Mohl's opinion, that the opening is covered with a tender membrane, and as I could not comprehend how it was, that a secondary deposit could be absent from certain localities, I thought these places were little bubbles, such as are seen in a glass. This, however, was a mere conjecture. My delineator always denied the existence of this membrane. At last I was in hopes of convincing him: we saw it coloured, as it is represented in *Icon. Select.* part i. tab. v. fig. 6, 7. But, afterwards, I never saw any thing of the kind, and the microscope which I made use of had the quality of colouring objects under certain circumstances. Herr Schmidt still maintains, that the pores penetrate the walls; and if we are of a different opinion, my opinion, as a preconceived one, must be doubted.

I likewise not unfrequently observed; especially at the edge of the pores, that several membranes of the same kind were situated one above another. This may often be seen very distinctly in the tubes of the liber. See *Icon. an. Bot.* F. 1, table 6, fig. 15. Payen's experiments prove, that the deposits

are different from the membrane formation. The spiral formation belongs to the membrane, because it is not dissolved by being boiled in caustic potass or soda.

Mohl has taken great pains to refute Meyen's assertion, that the vegetable membrane is formed of spiral fibres. This assertion is only of value as far as it goes, because, by far the greatest number of membranes, in the vegetable kingdom, do not exhibit such a composition. I told him, immediately, that I could not find what he had, even in the aerial roots of his *Stelis*. It is very remarkable, that many portions of plants have a tendency to split into a spiral line; but this only takes place with the thicker parts; for instance, with the old porous vessels, and even with the bark, as in the birch tree. We need not, therefore, go back with *Mohl* to a molecular position, but leave that to the natural philosophers. And if the membrane were ever so thin, it would be a more simple assumption to suppose still thinner places, in which the membranes tear themselves to pieces. It is very true, that no definite and distinct difference exists between vessels and cells in the vegetable kingdom, yet we must retain the expression of the difference for the science, in order to prevent confusion. If we were to call the external part of the flower of grasses, bracts, or leaves, because they, in point of fact, happen to be bracts, and eventually leaves, it would give rise to infinite confusion; and how many terms would not be necessary, in order distinctly to express what bract or what leaf is alluded to? Raspail, indeed, has given such a description of grasses, and it was only owing to no notice being taken of it, that it did not occasion confusion.

The *vasa propria* of the calyx of *Chelidonium majus*, I have caused to be represented in the second volume of the *Icon. Sel. An. Bot.*, t. vi. fig. 1 (1840). The arrows attached to the figures indicate the direction of the current. It follows thence, that the current does not always originate in the flowing out of the juice from the parts that have been torn off, as many believe, and as, indeed, often is the case, for the stream by no means runs towards the outside, but rather from the outside towards the inside. As the calyx of *Chelidonium*

is very thin,¹ we only need to tear off the small leaf, without making any incision, when it leaves only a small spot from which the juice can flow. This discovery, made by Herr Schultz, is therefore certainly a peculiar discovery, and is readily seen, without there being any necessity for making the observation in sunshine. For the movement which is seen in the sunshine, especially in leaves that have been torn off, is an optical delusion, and the stream may be directed at pleasure towards one or towards the other side, according as one turns the mirror. Professor Amici convinced me of this, at the Assembly of Naturalists at Pisa, in the autumn of 1839. The flickering motion, which is seen simultaneously with this, may likewise be owing to an optical delusion. These peculiar vessels, which in Latin one might probably term *vasa laticifera*, are by no means always simple in *Chelidonium majus*, as I formerly believed, but branched. Simple they certainly are in the vicinity of the leaf nerves, and in that of the bark of the root, and in the wood of the trunk. As such they have also been represented in the Icon. An. Bot. tab. 14, figs. 6, 7; 8. It appears to me, that the branching of these vessels may be mentioned as a principal character, by which they may be distinguished from all other vessels, even when they have no coloured juice. But these vessels must not be mistaken for the long cells, or the vessels in the accompanying tissue (the woody bundles), which never are branched, never carry a coloured juice, and in which a movement of juice has never been observed, which mistake, indeed, has been committed by many, and is still made. The circumstance of the latex vessels having been investigated only in the vicinity of the woody bundles of the trunk, and of the leaf nerves, in which very localities they are simple and similar to those of the liber, has given rise to this error. Their curved and branched forms may soon, however, be found, when they are examined in the flat parts, and removed from the nerves.

Stomata are represented in the second volume of the Icon. Sel. F. 2 (1840), tab. 4 and 5: First, *Stomata* of the usual form, consisting of two curved cells, having a slit-like opening between them, and which are surrounded by one or more



annular cells: fig. 8, of *Epiphyllum phyllanthus*; figs. 9 and 10, of *Opuntia vulgaris*; fig. 11, of *Cereus flabelliformis*. The chlorophyll forms, in figs. 9 and 10, an oblong substance. The enclosure in *Rhipsalis salicornioides*, fig. 7, consists of several cells placed in a circle, and the internal curved cells are also seen grown together into a small ring. The stomata of the *Hakea pugioniformis* are also of the same form, but a veil, consisting of a deposited matter, which wholly or partially over-spreads the stomata, is also frequently seen in them, although not always. Fig. 3, of the fourth table, exhibits a quite free and a half-veiled stomate; fig. 4 an almost entirely covered stomate. This veil, or rather obstruction to the stomate, is seen still more distinctly in the stomata on the leaves of the *Coniferae*. Table 5, fig. 6, of *Cunninghamia sinensis*; fig. 7, of *Picea excelsa*; fig. 8, of *Picea alba*. Free and obstructed stomata, at one and the same time, are found on the leaves of *Araucaria excelsa*, fig. 2, and of *Araucaria imbricata*, fig. 4. On boiling the leaves with water, the stomate becomes free, as may be seen in the stomate of *Araucaria imbricata*, fig. 5. Boiling them with spirit of wine does not affect this so readily. I did not succeed at all in doing it. I have always entertained doubts, that the stomata were the air holes of plants, and consequently the organs of respiration. I do not find a distinct connection between the stomata and the chasms in the cellular tissue of the leaves. It always appeared strange to me, that organs of so distinct a structure should only lead to mere chasms in the cellular tissue; and the obstructing and covering matters which they produce, have finally induced me to consider them as organs of secretion.* But I must leave the matter in doubt, for I confess, that I should not know what to say, if I was to be asked, "What secretions are formed by stomata in which such obstructions are not observed?" Certainly much has been said about open and closed stomata. I myself have said much, and it is very possible that the obstructed stomata have been taken for closed ones.

* Mention will be made of a contention between Dutrochet and Delile respecting this subject, in the Annual Report for 1841.

But let us hear what Schleiden says respecting these things. "In vain" (he says, in his inoffensive observations respecting the nature of the stomata, in Wiegmann's Archives of Natural History for 1838, vol. i. p. 57) "have I tried to ascertain a fact, by which it might be rendered probable, that these secretions originate more from the exhalations of the alleged glandular cells, than from those of the other parenchymatous cells, especially from those which border immediately on the cavity into which the stomata conduct; and it appears to me, that the alleged function, considering the present state of the science, is nothing but a mere *petitio principii*. For instance, let us take the *Coniferae*. Here I find resin on the stomata; on removing this by etherical oil, the stomata exhibit a continually increasing chasm. I next find beneath it a cavity, which (including the two curved cells) is surrounded by nothing but cells which contain gum, mucus, some starch, chlorophyll, but no trace of resin or turpentine; on the other hand, I find large turpentine ducts much lower down in the parenchyma; and I now conclude, that the volatile turpentine oil makes its exit from those ducts in the form of vapour, arrives at the intercellular cavities by following the intercellular ducts, and evaporates into the atmosphere through means of the stomata; in doing which, according to its nature, it leaves a certain quantity of resin. This inference appears to me quite natural. But, on the other hand, if two of those perfectly equal cells, filled with green matter, are arbitrarily chosen, and supposed to constitute glands which secrete resin, because they happen to be situated near the exterior, I really cannot see how this can be justified by any kind of logic." I find the cells beneath the resinous covering of the *Cistaceae*, and of many other plants, green; and I cannot conceive how the oil of turpentine, which is alleged to make its exit from the turpentine ducts in the shape of vapour, can leave resin in the stomata. However, I am glad that my opinion is similar to that of my friend Berzelius. He has certainly been still more abused about it than myself, because he is a greater man than I am.

In the "Journal of Natural History and Physiology, by Van der Hoeven and De Vriese, Leiden, 1840," we find, p. 185, a

paper, entitled, "Micrometrical Determinations and Microscopical Researches, by P. Harting." Many micrometrical determinations of vegetable objects are contained in this treatise, of which I will only enumerate some, because the whole table would otherwise have to be copied here. They are stated in ten thousandth parts of a millimeter. The smallest spiral vessels from the chalaza of an oak, impregnated within a few days, measured 33 ten-thousandths of a millimeter; the thickest, from a twig of one year old of *Sambucus nigra*, 425; the thinnest from the same, 140; the spiral fibre from the former, the thickest, 39; from the latter, the thinnest, 27. The average diameter of the dots, on the dotted spiral vessels from the same twig, 48. Rings from an annular duct in the same twig, average diameter, 38. Stomate of a tolerably large leaf of *Lilium candidum*, average length, 712; average width, 520; average length of the slit, 420; average width, 123. Stomate of a matured leaf of *Leontodon taraxacum*, average length, 230; average breadth, 130. Stomate of a matured leaf of *Lemna minor*, average length, 192; average breadth, 160; average length of the slit, 142; average breadth, 90. Pollen granules of *Malva rotundifolia*, 1341: of *Lilium candidum*, average length, 925; average breadth, 392: of *Lathyrus odoratus*, average length, 517; average breadth, 283: of *Salix alba*, average length, 272; average breadth, 126: of *Lamium purpureum*, average length, 412; average breadth, 248: *Laminium album*, average length, 308; average breadth, 202: of *Aconitum Napellus*, average length, 83; average breadth, 47. Chlorophyll grains from a leaf of *Sambucus nigra*, average diameter, 50: of *Chelidonium majus*, 55: of *Sedum telephium*, 67: of *Geranium robertianum*, 52: of *Malva rotundifolia*, 51: of *Iris pseudacorus*, 42: of *Lilium candidum*, 30: of *Georgina variabilis*, 34: thickness of the layers of a grain of potato starch, 8-30. Although some uncertainty always takes place in micrometrical measurements, these statements are, nevertheless, very valuable as proportional numbers; and it is therefore very desirable, that the same observer should continue his observations with the same instrument. The number of animal objects which were measured is much greater

than that of the vegetable ones. I only beg to remark, that the blood-globule (*bloedshyffjes*, blood-shields as the author calls them, which is a new Dutch word) of almost all animals are larger than the grains of chlorophyll. The muscular fibres of animals, on the other hand, are generally thinner than the spiral fibres.

The invention of M. Boucherie, of imparting useful qualities to wood, by causing different fluids to be imbibed by it, deserves mention at the conclusion of this department. (See *Comptes Rendus*, 1840, vol. i. p. 686). The thought was suggested to him by the well known experiments, causing coloured fluids to be absorbed by, and to rise in the vessels of plants. Those experiments, which have hitherto been merely instituted for scientific purposes, he wishes to apply to purposes of general utility; or, as he expresses himself, he is desirous of creating an industrial power from the vital power. The operation is performed on a tree which is still standing upright, by making a transverse incision, so as to bring the sap vessels in connection with the solution which the tree is to imbibe; sufficient wood must, therefore, be left standing at two opposite points, so as to enable the tree to retain its vertical position. The absorbing power decreases on separating the tree from its roots (*de sa souche*), and from the moment of its being hewn down; use may, however, be still made of it for two days, or even for a longer period. This power, however, is different at different seasons; it is strongest in the autumn. The quantity of fluid which is absorbed also varies very much; but, as a general rule, it may be said, that the neutral combinations are imbibed in greater quantities than the acid and alkaline. In order to render the wood durable, he causes the brown coal-tar (*pyro-lignite de fer*) to be imbibed; and to impart to it a greater flexibility and elasticity, he makes use of solutions of soluble chlorides, and the same are also useful in preventing the wood from being warped, and serve the purpose of rendering the wood less combustible. The dying of the wood is done by mineral or vegetable substances. If the former be used, the liquid already coloured must not be used, but two liquids must be applied successively, which produce colour by their

mutual decomposition ; thus, if one wants to dye^d blue, first a salt of iron, and then cyanide of potassium (cyaneisenkalium) must be used. Coloured vegetable liquids are incapable of being imbibed. Certain woods, indeed, do not imbibe any thing^d at all. These practical applications confirm, very strongly, the now almost generally adopted theory of the rising of the sap in plants. Further on, mention will be made of the formation of vessels and cells, especially on speaking of the treatise of D. Don on the *Cycadaceæ*, and of Schleiden on the *Cactaceæ*.

STEM, LEAVES, AND BUDS.

OUR knowledge of the stem has been enriched by an elaborate work, which well deserves the attention of investigators :—On the *Structure and the Growth of Dicotyledonous Stems*, by D. F. Unger ; a prize treatise, to which the reward was adjudged by the Imperial Academy of Sciences at St. Petersburg. St. Petersburg, 1840, 4to, 204 pages, 16 tables. We will follow the author as far as our space permits, for to him the science of the physiology of plants owes much already. He first enumerates the usual division of the stem into pith, wood, and bark. The wood he again divides into the medullary sheath, the real wood, in which the ripe or heart wood is but little distinguished from the alburnum, and the cambium-layer, which he describes as a layer of tender cellular tissue. The bark he likewise divides into the upper layer or epidermis, the cork-layer, and the cellular integument. The latter, he says, contains chlorophyll nodules, and is the substance which forms the medullary rays. This is followed by a history of the theories on the growth of the *Dicotyledons*. I will not refer to the statements of others on this subject ; but he has entirely mistaken what I have said. After having referred to a former opinion of mine, which is incompatible with my later opinions, he states the following, page 27 :—“ It is the opinion of both Link and Meyen, that the stem grows through the buds, which means, that the new layers of wood are the produce

of the buds.⁹ The former says (El. Phil. Bot., Ed. ii. 261), it may be seen with the naked eye, that a layer of wood issues from the bud into the branch beneath, and attaches itself to the wood, and on using the magnifying glass, young spiral vessels, &c., &c., may even be perceived to penetrate into the branch." If the author had taken the trouble to read the sentence, he would have seen, that I certainly said, "That vessels with a cellular tissue issue from the bud downwards into the branch," but by no means, that the entire new layer of wood was formed by it, but that the latter also grows to it from the sides, so that the vessels, as it were, inoculate one another. The manner in which this is done, I have not only elaborately described, but also representd in the seventh table of the Icon. Anat. Bot. part i. table 7, fig. 6-12. He recurs to my former opinion in page 111, and carefully states who has confuted it. He then adds, p. 112,—“Link has latterly changed his views on this point, and he pronounces the spiral vessels, in the vicinity of the pith, to be unchangeable, as Mirbel and others have shown. He gives ‘the alder’ as an instance, which exhibits, after forty years, the same vessels that it had at first.” This is all that he says of my representation, and he has thus shockingly mutilated it. He also says, p. 121,—“Link places the cambium layers with the liber, and calls them ‘internal liber.’” The sentence referred to treats of the sap, which I certainly distinguish from the cambium. But this shall not influence my analysis of what follows.

The third division treats of the structure and the growth of the *Aloineæ*. He commences with these, because they have the greatest similarity in their structure with the *Dicotyledons*, as the stem consists of bark, wood, and pith. The author draws the following inferences from his researches upon the *Dracæna ferrea*:—1st, A homogenous tissue, which belongs to the cellular system, and which is distinguished by the circumstance of its extended cells carrying a more or less cloudy coloured juice, is the original basis of the vascular or woody bundles. 2d, The development of the vascular or woody bundles, considering it in its whole course, does not take place in an uniform manner, but portions of it are capable of being

developed in a higher degree, whilst others remain in their original simplicity. 3d, The same central point from whence a perfect development of the vascular bundles takes place in both directions, is the point also where the latter leave the stem, to the formation of which they contribute the essential part. 4th, Between the internal or the stem-part, and the external or the leaf-part, of the vascular bundles in the plant, there is an opposition, which, remarkable enough, never produces an identical matter, but only that which is analagous, and in proportion to the distance from the central point. 5th, With regard to the nature of the elementary parts, or the origin of the vascular bundles, it appears that the proper vessels (*vasa propria*) form the first and most essential part of them (the author explains, that the proper vessels consist of thin walled cells, consequently they are very different things from those which are called so by other Botanists), not only in as much as they are the elementary parts which first of all appear, but also because they form the most permanent part of the tissues, and never entirely disappear among all the metamorphoses of the vascular bundles, and consequently cannot be replaced by other tissues. I must leave it to others to search for proofs of the truth of these conclusions.

IV. *Comparison of the Development of the Vascular Bundles in different Monocotyledons.*—In this part, the course of the vascular bundles in the palms, according to Mohl, and in the *Aloinæ* (in which there is no ramification, as Mohl found in the palms), as Meneghini describes it, is adopted. The course and ramification of the vascular bundles in the *Ananas*, and also their course and entangling in the grasses, are considered.

V. *On the Structure and the Development of the Piperacæ.*—We give the authors own words on this point. In all *Piperacæ* there is a central system of vascular bundles, which may be distinguished from a peripheral system; these two systems consist of parallel vascular bundles, which run through the stem, and nowhere anastomose with each other.

The two systems unite themselves in the node into a fibrous net-work, from which spring buds and roots, in such a manner that their separated systems of vascular bundles enter into immediate connection with those of the stem. The formation of the wood only takes place through the peripheral vascular bundles, by the production of woody matter on their outside, and which consists partly of new vascular bundles, and partly of cells of prosenchyma. The system of vascular bundles of the appendices is only connected with the central system of vascular bundles towards the exterior, and appears as its immediate continuation. A part of the same system of vascular bundles continues its course upwards, from which it follows, that a continued growth of its bundles is peculiar to this system of vessels (*vegetatio terminalis*). The same also holds good with regard to the peripheral system of vascular bundles; but since this enlarges itself towards the exterior by the deposit of vascular bundles, of a second, third, and fourth rate order, it exhibits a complicated vegetation. The author calls this mode of growth "*vegetatio peripherico-terminalis*." He then speaks of the structure of the related genera, *Saururus*, *Houttuynia*, and the *Chloranthaceæ*.

VI. On the Structure and Development of the *Nyctagineæ*.

—The following are the results of the researches which the author instituted with regard to the formation of the stem of the *Mirabilis*. A double system of vascular bundles may be distinguished, an internal and an external one. The internal system is simple, and consists of a zone of vessels, and of the central vascular bundles enclosed by it, and which enter into the leaves; the external system, on the other hand, consists of many circles of vascular bundles, which are situated one above another, which, independent one of another, are formed from the former, and are only cemented by anastomosis. A peripheral growth, in the manner of the *Monocotyledons*, does not take place internally nor externally, but a growth, progressing towards the axis, that is, a *vegetatio terminalis*. A peripheral vegetation, however, appears here, when both systems of vascular bundles are regarded in the

relation of their development to each other ; hence a vegetatio peripherico-terminalis takes place.

VII. *On the Structure and Growth of the Chenopodeæ and Amaranthaceæ.*—A double system of vascular bundles exhibits itself in these stems, an internal one, connected together through the entire stem, and situated in the pith or at its edges, and an external system, likewise connected together through the entire stem, and which increases itself from the outside, forming, as it were, the wood. The two systems are perfectly different from each other in point of essential composition ; but the internal system, which provides the appendicular parts with vessels, and the external system, which belongs to the stem, are both found in such a way, that (excepting that each vascular bundle enlarges itself to a certain extent in its diagonal towards the outside) only one uniform progressive growth towards the upper end can be perceived. The type of a vegetatio peripherico-terminalis is, however, also manifest here, if we regard the fact, that the stem, through the agency of the continual formation of new layers of wood, grows towards the outside.

VIII. *On the Structure and Growth of the Arborescent Dicotyledons.*—The author infers, from the examination of young willow twigs, that the vascular bundles, which contain the vessels of the medullary sheath, correspond with the central system of vascular bundles of the herbaceous *Dicotyledons*, only with this difference, that the cardinal vascular bundles seem to be wanting in the system of the latter, whilst they maintain a distinguished position in the former plants. The real woody substance is formed here, as well as in the herbaceous *Dicotyledons*, by a peculiar system of vascular bundles, having nothing to do with medullary sheaths, and forms a mass, which, by means of prosenchymatous wood cells, possess a tendency to increase from within outwards. For the better explanation of the whole, I will add to the preceding, one sentence from the author's general inferences :—In all plants provided with vessels, there are only three kinds of vegetation ;

1st, The vascular bundles of the stem extend themselves, in their development, towards the upper part of the stem, without multiplying themselves; and by this mode of growth, produce additions to the point or the end acrogenous growth (*vegetatio terminalis*), as is seen in the *Cycadaceæ* and Ferns. 2d, The vascular bundles of the stem have only a certain length, and the stem is enlarged and lengthened by new vascular bundles, which are added to those already existing, and attach themselves to those on the outside and over them; this produces the endogenous growth (*vegetatio peripherica*). Finally, A third kind, which is perfectly distinct from the two preceding kinds, and which is distinguished by the circumstance, that the vascular bundles do not only extend themselves towards the upper end, but at the same time towards the outside, which occasions the formation of a central and peripheral system of vascular bundles. This kind of vegetation is exogenous (*vegetatio peripherico terminalis*).

IX. *Anatomical character of the Cambium Layer.*—The author here particularly alludes to the growing together of the cells; he believes, that this may be best observed in the lower plants, as in the *Algæ*; and by researches on the subject, combined with other circumstances, he has come to the conclusion, that the increase of the cellular tissue is principally effected by division.

Every attention is due to the researches of the author, but, in my opinion, he has overlooked many things. It is, in the first place, indispensably requisite, to distinguish the different kinds of stems, if we wish to obtain a correct view of the structure of the stem. In relation to the researches of the author, two kinds may be mentioned:—First, *The Genuine Stem* (*caulis genuinus*), which continues to grow by means of buds, so that the buds extend themselves in length, and the leaves being in the course of development pushed asunder, the lowest leaves, or even the covering leaves (*tegumenta*) of the buds fill their places. This kind of stem is peculiar to all *Dicotyledons*, if we except the stemless plants (*Pl. acaules*), to the grasses, the *Smilacæ*, and some of the *palmeæ*. Most of

the palms, the *Dracænæ*, the *Pandaneæ*, many *Alcornoecæ*, and similar plants, have such a stem. The author has overlooked the circumstance of the increase of the pith in the growth of the genuine stem, which always precedes the growth of the bud; and, indeed, almost forms the latter in its first state. Spiral vessels grow subsequently, and attach themselves to the older vessels of the stem, and to the internal vessels which are in contact with the pith. It is, however, not correct, when the author compares the medullary sheath of most of the *Dicotyledons* with the central system of vascular bundles of the *Piperacæ*, *Nyctagineæ*, and *Amaranthacæ*. The latter plants, in their infancy, have only a circle of vascular bundles, which grow outwards by means of spiroids and prosenchyma, and frequently also laterally, for the eventual purpose of forming a ring of wood. It is not always the case, that the lateral growth produces a genuine ring, but gaps remain between the vascular bundles, as in the *Umbellatæ*, *Cruciferæ*, and some others; the *Amaranthacæ*, however, are different, as also *Monocotyledons* generally. They have, even in their very first days of growth, several rings of vascular bundles, of which the external one develops itself into a woody ring. The author has taken notice of the entangling of the vascular bundles in the nodes in the stems of the genuine *Monocotyledons*. I have caused this to be represented, in the *Icon. Anat. Bot.* part i. t. 2, f. 5, 6, I flatter myself, with accuracy. The author also has observed the growth of the vascular bundles in the cauloma. The taking the *Algæ* as examples of the growth of the cells, appears to me to be calculated to occasion errors.

Perhaps I may be permitted to make a few remarks on the formation of layers in the *Dicotyledons*. It is a well known fact, that letters, carved figures, and foreign substances, are frequently met with in the very middle of trunks. I found such letters in a lime tree near Berlin, on an estate belonging to the deceased minister, Count von Lottum; the letters on one side of the split piece were hollow, as represented, *Icon. Sel. Anat. Bot.* part ii. t. 2, fig. 7, on the other elevated, and the cavity had evidently been filled up again with

a woody substance, as exhibited in fig. 3. This filling up substance, on making a transverse incision, exhibited rather irregular layers, with a moderate magnifying power. It appeared as seen in fig. 9; and on being magnified by 315 diameters, it evidently consisted of strata of larger and smaller cells, partly filled up, partly empty, with interstices, as seen in fig. 10. The circumstance, however, which appears particularly remarkable, is, that the internal structure of the filling up substance, as exhibited in fig. 11, on a longitudinal incision, corresponded very nearly with the old wood, fig. 12, situated next to it, with the difference only, that spiroids existed in the former, which were entirely absent in the new wood. It will be seen, therefore, that the formation of layers is peculiar to the wood, and is by no means caused by any external influences.

A treatise of D. Don, on the *Cycadeæ* (Annals of Natural History, vol. v. p. 48), was read at a Meeting of the Linnæan Society, in January, 1840. The author states, the stem in the *Coniferæ* exhibits the formation of other *Dicotyledons*; the annual zones are distinctly marked, and a distinct separation is also seen between wood and bark; this is not the case with the *Cycadeæ*. They resemble the *Monocotyledons* in this respect, but are distinguished from them in others. *Cycas* has, besides a large central pith, several thick, concentric, developing layers of cellular and fibro-vascular tissue; in *Zamia* and *Encephalartos*, there are, besides the pith, only two very thick layers, an internal layer of fibrous tissue, and an external layer of cellular tissue. The *Cycadeæ* do not share the peculiarity of the wood of *Coniferæ*, which consists of parallel regular dotted tubes; but there are, in it, dotted, reticular, and spiral vessels, besides slender transparent tubes, which are without dots or any other distinction. The dotted vessels of the *Cycadeæ* certainly resemble the same tissue of the *Coniferæ*, but the dots are placed much more irregularly, not only in different vessels of the same bundle, but also in different localities of the same vessel. Their form is oblong or elliptical in *Cycas revoluta*, *glauca*, and *speciosa*; *Zamia furfuracea* and *pumila*; as also in *Encephalartos horridus* and *spiralis*; but sometimes they are longer, smaller, and

almost lineal, giving the vessel the appearance of being striped across. The dots are always arranged in the diagonal direction. The dotted vessels in *Zamia furfuracea* and *pumila*, may be unrolled spirally, in the shape of a ribbon, as in the ferns; the act of unrolling takes place in the direction of the dots, and from the right towards the left. Other vessels, which differ but little from the spiral vessels, excepting in their tendency to unite themselves in their windings, are to be found in all *Cycadeæ*, besides the dotted vessels. The spires in some vessels are free, and the fibre frequently exhibits, at various places, slits or little branches; the spires, in other cases, unite on one or on both sides, in which case the vessels exhibit a series of rings or bars; the fibre, in that case, is difficult to be untwisted, and frequently breaks off in the ring, or the bars separate themselves at the points where the spires unite, which usually takes place on the perpendicular sides of the vessel. The vessels, in other cases, are reticular, and as such there is a great analogy between them and the dotted vessels in *Cycas revoluta*. All these modifications are frequently exhibited in the same vessel, in *Zamia furfuracea* and *pumila*, which proves the correctness of Meyen's theory, who reduces all these vessels to one type. The dots and bars are evidently the thinnest parts of the tube, and probably remnants of the primitive membrane of the cell, which has remained free from the subsequently deposited material.

The cellular tissue of the *Cycadeæ* consists of a pretty regular parenchyma of prismatical hexagonal cells. The walls of the cells, in the above mentioned species of *Zamia* and *Encephalartos*, appear uniformly thick and transparent, without dots, but the walls of the cells, in the old stems of *Cycas revoluta*, are provided with numerous elliptical oblique bars, dots, or spaces, where the membrane is so extremely tender and transparent, that the cells seem to be perforated, the interstices being covered with an incrusting material, in the form of bands, that run one into the other. The extraordinary tenderness and transparency of the dots, or of the interstices, of whatever shape they may be, seem to afford evident proof, at those places where they are not covered by

the incrustation, that they are derived from the original membrane of the cell. Tincture of iodine renders the membrane opaque, which evidently shows, that the interstices have no openings. The bands are evidently the result of a partial conversion into wood, and, indeed, no better instance can be given, to illustrate and confirm the correctness of the view which Schleiden has given of the origin of the bands and fibres in the vessels and cells, than the *Cycas revoluta*. The author being anxious to ascertain whether the bands already existed at a former period, examined a young undeveloped frond, about two weeks old, and was glad to find his opinion confirmed; the cells were of a uniform transparency, and exhibited neither dots nor bands, but had a distinct cytoblast or nucleus, which had entirely disappeared from those cells in which the incrusting material was observed; which proves, that this incrusting material had formed itself at the expense of the nucleus. The material which forms the band is connected, and has evidently not been produced by a growing together, as one might suppose, for it is perfectly solid, and exhibits no disposition to unroll itself, or to degenerate into fibres. The bands were probably produced by the circumstance, that the incrusting substance, which first flowed over the walls in a liquid state, contracted itself, and by the mere effect of condensation, supported by the distention, and probably the enlargement of the cells, naturally left parts of the primitive membrane uncovered. The author, however, notwithstanding the analogies exhibited by the reproductive organs, considers the relationship between the *Cycadeæ* and the *Coniferæ* very remote, and supposes the *Cycadeæ* to be the remnants of a class of plants which belonged to a former vegetation.

The description is accurate and striking, and his conclusion, that the *Cycadeæ* has but a remote relationship with the *Coniferæ*, ought to be well considered by those who assimilate these two natural orders with each other. A similar analogy takes place among the *Orchideæ* and the *Asclepiadææ* with regard to the fructification, and yet no one will be bold enough to place them under one head in the natural system.

The approbation which the author gives to Schleiden is

unwarranted, for Schleiden does not say that, which the author ascribes to him. According to Schleiden, the cytoblast produces other cells, which come forth when the mother cell is absorbed. I also beg to state, that Mr. Quekett mistakes Schleiden's meaning, when he asserts (*Annals of Natural History*, vol. v. p. 66), that vessels are produced from a cytoblast in a similar manner as the cells. The vessel at first can, with difficulty, be distinguished from a cell, but it soon lengthens itself, and the cytoblast disappears. Mr. Quekett supposes the fibres to be produced from small granules in a gelatinous mass, which granules join each other according to the different formation of the vessels. There is much more in Mohl's opinion which D. Don's observations favour. Meyen, however, was not the first who reduced the dotted, the reticulated, and the spiral vessels to one type.

I have endeavoured to illustrate the structure of the *Cycadeæ* in the *Icon. Select. Anat. Bot.* part ii. (1840), t. 1, more with a view to determine their position in the natural system, than to investigate the formation of the separate cells and vessels. A cauloma, from a withered *Encephalartos*, *Friderici Gulielmi III.*, served for the purpose of examination. A longitudinal incision through this cauloma is represented in fig. 1, one half of its natural size—a part of this incision, in natural size, in fig. 2. A large pith in the centre, a thin layer of wood, which forms a perfect circle, and a rather thicker bark, will immediately be distinguished. Thus far the structure appears to be very similar to the structure of the stem of the *Dicotyledons*. But, on more particularly observing the bark and pith, there will occasionally be seen curved bundles of wood in both, which, on being magnified at 82 i. d., are seen as bundles of spiroids both in the bark, fig. 3, and in the pith, fig. 6. Such a formation is quite foreign to the *Dicotyledons*, and as the longitudinal incision cuts through the woody bundles in various ways, it readily suggests the conjecture, that they may, perhaps, form a net in both parts. This becomes evident, on observing a longitudinal incision of the wood, through the medium of a glass of low power, fig. 4, where the net of woody tissue extends itself just

as much from the layer of wood, as in the nodes of the larger grasses, for instance, of *Zea*, *Mays*, and *Saccharum officinarum* (Icon. An. Bot. fig. 1, t. 2, figs. 5, 6); fig. 5 exhibits something of this entangling in the magnified degree of 82 i. d. The lower spiroids descend straight down, the upper make a curve towards the interior, and between them there is cellular tissue. A horizontal cellular tissue is also seen at g, like a medullary sheath, which has given rise to the conjecture, that the wood is produced here also from the cellular tissue, and that, by growing from the interior to the exterior, it compresses the cellular tissue. Every thing is the same here as in the *Monocotyledons*, the compound layers of wood, alone, are calculated to create doubts. We ought to consider, however, that the entire cauloma of the *Cycadeæ* is to be considered as a lengthened monocotyledonous node. In the second volume of the Icon. Anat. Bot. t. ix. fig. 1, I have caused a longitudinal incision of *Zamia Altensteinii* to be represented. The same kind of woody bundles, exhibiting a similar net as those possessed by *Encephalartos*, are also seen here. The spiral vessels of these bundles are represented, in a magnified degree, in fig. 2. The circular layer of woody bundles is not so developed in these *Cycadeæ* as in *Encephalartos*, *Fr. Guil.*

The leaves of the *Cycadeæ* have a peculiar character. They are jointed at the base, that is, they are seated upon a stalk, from which they fall off, as soon as the stem or they themselves begin to wither. This stalk is of the same thickness as the lower part of the leaf, and exhibits, externally, interruptions towards the end where it is joined to the leaf, which, however, do not extend themselves into the interior. Other leaf-like parts are found beneath these leaves, one such part being under each leaf. See Icon. Sel. part ii. t. 1, s. 1, 2, and t. 2, s. 1, 2. If now we should assume, as a general law, that the branches issue forth from the axil of a leaf, and are, therefore, supported by leaves, that two genuine leaves are never seated one under another, or that one leaf is never situated in the axil of another leaf, we should, in such case, have to consider those parts of the *Cycadeæ* which are

usually called leaves, as branches, and the leaf-like parts under them as genuine leaves. The term fronds, which Miquel gives to these leaves, in a recent treatise respecting the *Cycadeæ*, is very suitable, because it represents a sort of intermediate state between leaf and branch; like the fronds of ferns. Miquel, indeed, seems to have derived the expression from the latter. The leaf-like parts might be termed *squamæ foliæ*. Such, for instance, occur in the *Asparagus*, where the so called leaves ought to be considered as barren flower-stalks. There are also *squamæ foliæ* beneath the so called leaves of *Ruscus*, *Phyllanthus*, &c.

Some remarks by George Gardner, on the *Structure of the Stems of Palms*, may be found in the *Annals of Natural History*, vol. vi. p. 57. The author refers to a sentence in Lindley's *Introduction to Botany*, where Lindley states:—“The investigations of Mohl appear to show, that this view of the structure of endogens requires some modification. According to this observer, every one of the woody bundles of a palm-stem originates in the leaves, and is at first directed towards the centre; arrived there, it follows the course of the stem for some distance, and then turns outwards again, finally losing itself in the cortical integument. In the course of their downward descent, the woody bundles gradually separate into threads, till at last the vascular system, which for a long time formed an essential part of each of them, disappears, and there is nothing left but woody tissue. In this view of the growth of endogens, the trunk of such plants must consist of a series of arcs, directed from above inwards, and then from within outwards; and consequently the woody fibres of such plants, instead of being parallel with each other, must be interlaced in infinite intermixture.” Lindley, farther on, enumerates some difficulties with which the formation and the direction of the woody bundles, in reality, according to Mohl's statement, would be attended. Gardner, when travelling in the Brazils, caused a palm tree, which is called *Coqueiro* by the Brazilians, to be split, and in the trunk he found very large woody bundles, which were readily traced. As soon as they come from the leaves into the trunk, they

make a gentle curvature of about 18° downwards and inwards, until they nearly reach the centre of the column; they then change their direction, and turn downwards and outwards, with a greater obliquity than before, until they have nearly reached the external surface of the trunk; they now descend downwards in a line parallel with the axis, until they at last get so much ramified as not to be followed further. Lindley, as above stated, found the first difficulty in Mohl's statement to be this, that the lower part of the trunk is, as it were, obstructed by the woody bundles, and must, therefore, unquestionably be equally hard. Gardner, however, asserts, that the woody bundles of the upper leaves do not descend quite down to the bottom, so that the lower as well as the upper part thus retain an external hard and an internal soft part. Lindley further says, the lower part of the bark must be much harder than the upper, because a greater quantity of woody bundles are there met with. That indeed is the case, replies Gardner, and every Brazilian knows it. Lindley says, thirdly, The hardness of the external part of the trunks of the palms cannot originate in the pressure of a new growth from the interior towards the exterior, but from a cause which would correspond with the production of the heart wood in the exogens. Is there such a cause, he asks, in the endogens? Gardner replies, The woody substance in the endogens is evidently produced from the leaves, and from this it may be inferred, that the same is the case with the exogens, as Du Petit Thouars has already asserted. The only difference appears to be this, that the woody fibres, in the exogens, remain between the bark and the last layer of wood; while, in the palms, they turn downwards and inwards, then gradually downwards and outwards, and finally descend parallel with the axis.

The remarks of Mr. Gardner appear to me to be, upon the whole, very correct. There is another difference to be observed, namely, that the trunk of the palms forms itself solely from the leaves, whilst other trunks do so from buds from which branches are developed.

Contributions to the Anatomy of the Cactaceæ, by M. J.

Schleiden, is the title of a treatise which was read to the Academy of Sciences at St. Petersburg, in 1839, but which was only published at a subsequent period. The author first speaks of the parenchyma of the pith and bark, and says:—The cells are almost all globular or elliptical; the connection between the separate cells is so loose, that they are generally torn asunder by one incision, so as to render it a rare occurrence to see a cell which has been cut through. The sap, which in its youngest state always occupies the intercellular spaces, retires during its gradual drying up into the commissures (*Fugen*), and there forms a slight distention, filling up the vicinity of two cells. On the cells being separated, as described, the point of contact exhibits itself as a circle or ellipsis, surrounded by a slight elevated ring. Meyen has delineated these round circles from the *Oncidium juncifolium*, in which plant such a loose cellular tissue likewise occurs, and considers them, wrongly, as it appears to the author, large pores. The author has convinced himself, by researches and comparison in an infinite number of cases, that all porous canals proceed from the primary cell-wall; and if they do not seem to reach as far as that, they are then only fragments of a canal which has been cut through. Such perfect canals are, however, never seen to terminate in an intercellular space, nor even upon a part of the cell-wall, which confirms Mohl's view. The contents of the cells of parenchyma, always consist, in the first instance, of mucus in little globules, or of starch, both almost always covered with chlorophyll. It is of frequent occurrence amongst the *Cactaceæ*; that the starch is the bearer of the chlorophyll; and, in this instance, it may readily be observed, that the starch, after having been liberated from the chlorophyll through means of alcohol, is always a long time before it acts upon iodine, as for instance, in *Opuntia brasiliensis*. Besides the ordinary cells of parenchyma, we also find, in very many *Cactaceæ*, cells of two or three times the size of the former, distributed in the bark as well as in the pith, which are entirely filled with vegetable mucus. This mucus has also a kind of organization. It forms a globule, and is very finely marked on the surface with small

furrows, similar to what in art is called "on vermeil." The different crystalline forms of oxalate of lime, as found in the *Cactaceæ*, are stated. The author found, in 100 parts of the perfectly dry vegetable substance of plants, 85.57 of oxalate of lime, 5.75 humic acid, 7.79 vegetable fibre, and 0.92 loss. The *Cactaceæ* frequently contain carbonate of lime, besides oxalate of lime, and that often in perfectly formed "rhombohedrons," as, for instance, in the *Cereus triangularis*. The opinion of the author, that young cells form themselves from a cytoblast, and then make their appearance after the resorption of the mother cell, he endeavours to prove by observations made on very young bulbs of *Georgina*, where two cells develop themselves from a cytoblast in one mother cell. The author then proceeds to treat of the external layer of the bark, the epidermis, and the outer bark. He says, besides the ordinary bark-parenchyma, we meet with, in the one-year-old shoots, beneath the epidermis, in almost all plants, particularly of those which convert themselves into wood, a more or less thick layer of peculiar cells, the walls of which are in a different chemico-physical state to those of the ordinary cell-membrane of the parenchyma. This tissue contains most water when in its youngest state, and is almost identical with vegetable mucus; it hardens subsequently through the loss of water. The cells at first have thin walls, but thicken in their gradual development, but owing to the gelatinous quality of these walls, it was impossible for the author to distinguish layers; but pores presented themselves, which may here be observed to particular advantage. The various changes of this cellular tissue are given. The commencement of the formation of the outer bark, or rather of the formation of the cellular layer, consists, according to the author, in the fact, that a darkish, yellow-brown, granular mucus matter collects itself in a certain locality in some of the epidermic cells. This substance gradually increases, till it bursts the sidewalls of the cells, and raises the upper walls, which are connected together in a continued membrane, whilst the lower walls remain firmly combined with the layer of bark situated beneath. In the third place, he treats of the wood. There is

Nothing more easily seen, says the author, in the *Monocotyledons* with shortened internodes, than that the older vascular bundles cross (in their peripheral course) the younger vascular bundles, which are situated towards the outside, and thereby form a longer or shorter curve. This is more difficult to observe in the *Dicotyledons* generally, but is easily seen in some of the *Mammillarias*. Here is found the curved course of the fibres, the crossing; and, in short, every thing that has erroneously been considered as a peculiarity of the monocotyledonous stem. Lastly, he gives the history of the formation of the wood. The inner cells, a small bundle of the yet tender cells, cease to develop themselves, and begin to form thickened layers by spiral deposits. The cells are extended in length by joining the adjacent distended cells, and frequently so much so, that the cell-membrane dries up and is absorbed, so that the spiral fibres frequently get into the intercellular spaces, as is often seen in the *Cactaceæ*. The spiral fibres are subsequently converted into rings, by a regular and gradual distension. The cells of woody fibre extend themselves longitudinally, and when this extension no longer corresponds with the extent of the whole plant, they are then compelled to force themselves with their ends between each other, and as it were, to grow into the intercellular spaces of the other tissues. When the formation of cells ceases in the internode, it nevertheless still continues in the cambium in the *Dicotyledons*. The cells form themselves into two or three very unequal parts, to which a fourth is sometimes added. The largest inner part forms wood cells, the external (third if existing) remains partly parenchymatous, and partly forms itself into cells of the liber, whilst the walls of the cells of the central portion (or, if the former is wanting, the external) remain quite tender and capable of propagation, and form the new cambium. The continued growth of the cambium is best observed in the *Cactaceæ*. Cytoblasts form themselves in the lowest cells of the cambium, and those small and tender cells grow upwards through the whole cell. Their contiguity to the next upper wall occasions the same process of growth, and thus it continues. The spiral-formed layers

are seen at an early period. Finally, the mother cells are perfectly absorbed, the inner cells becoming wood cells, the external, cambium, &c. Another process yet takes place during the production of lateral anastomosing branches; a cloudy, slimy, gummy liquid is produced in a certain series of cells of the parenchyma, from which a layer is precipitated, by which the parenchymatous cell is converted into a spiral or reticulated fibrous cell.

I have endeavoured to represent the theory of the author in the context, and have mentioned, that I consider the doctrine of the cytoblast as the producer of the young cells in a mother cell, the latter of which is finally absorbed, as a mere hypothesis, founded upon imperfect observation. I do not know of any profound observer who has adopted it. Foreigners, when talking of cytoblasts, merely mean the nucleus in many cells, the existence of which no one denies; they never allude to the mother cell. An example of it has been given above. Schwann has adopted Schleiden's views, and applied them to the animal world. I think, perhaps the animal cell, in this respect, may be formed in a way exactly opposite to the vegetable cell.

It has always been a question, whether the spiral vessels are air tubes, or whether they carry the juices for nutrition? I myself have twice changed my opinion regarding it, because it was more my object to arrive at the truth than to insist upon being right. Dr. Schleiden despatches this question very quickly. He says, "I found, almost without exception, in all *Cactaceæ*, that the vessels, as they issued from the cambium, were filled with air. Indeed, I must confess, that I cannot conceive how any one, who has examined a great number of plants with attention, and only applies sound logic, can set up the doctrine, that the spiral vessels, and the woody fibres associated with them, are intended to carry fluid. Never and nowhere is a fluid found in them, excepting during a short time in the spring, in the forest trees of our own climate, which may be accounted for very simply, by the superabundance of the rising sap, and the permeability of the cell-membrane, and which, being only a periodical phenomenon,

belongs as little to the usual course of vegetation, as the human uterus can be said to be a blood vessel on account of its menstruating. A considerable quantity of fluid flows out rapidly from the cut stem of the *Hoya carnosæ* in our hot-houses, but the microscope instantly shows, that all the spiral and porous vessels carry only air."

The answer derived from the rapidity of the flowing out of sap is not worth much; for every Botanist knows, or may readily convince himself, by placing a slice of a potato under the microscope, and adding a drop of tincture of iodine, when it progresses as rapidly through the walls of the cell as on the table, therefore the living membrane of the cell offers little or no resistance to the absorption of fluids. In the same way as inorganic substances are permeable (most of the perfect crystals, at least of the alkalies and earths) to the imponderables, light, warmth, &c., so also is the organic substance permeable for fluids. It is not the passing through of a fluid, which is the effect of a vital power, which requires explanation, but quite the reverse; it is the retention of the fluids in certain cells, which either originates from a particular organization, as in the epidermis, or from the difference of the medium on both surfaces (air and fluid), as, for instance, in the air cells, or from peculiar organic powers, as, for instance, in the cells with coloured juices, existing between the cells with uncoloured juices.

Since the lifeless vegetable membrane retains fluids, the most simple method is to attribute this as a primary quality also to the living membranes, and to search only for particular powers when they allow a fluid to pass through them. The juice which flows from the *Hoya carnosæ*, comes from the proper vessels, sap vessels, the same as the milky juice in the *Asclepiadaceæ*. These vessels generally, however, have no partitions. If, then, the nutritive sap made a rapid transition from the spiral vessels into the cells (withered twigs, for instance, placed in water, very quickly erect their leaves), would it be seen? But this is not the place for the investigation of this subject; it was only necessary to give Dr. Schleiden's statement in his own words.

Delineations of the internal structure of some *Cactaceæ* are represented in the Sel. Icon. Anat. Bot. part ii., tab. 3. The woody bundles in the stem of *Epiphyllum phyllanthus* are separated from each other at the points, where the stem has still its round form, and each bundle is surrounded by its alburnum, upon which follow the liber, separated in the same manner, and surrounded as usual by the bark, and opposite the woody bundles (see fig. 1). The alburnum consists of very tender small cells of parenchyma, the liber of very thick walls, or finely punctated liber vessels, rarely with partitions, but they are found in some (fig. 2); ramified, frequently reticulated spiroids are seen in the flat part of the stem, which are inclined towards the spot where the tufts of thorns are seated (fig. 3). The leaf, therefore, seems really to be transposed into the wings of the stem, for such a separation of vessels is not found in the stem of the *Dicotyledons*, nor in the stem of the same plant where it is round.

The internal structure of *Opuntia vulgaris* is likewise represented. A similar division of the spiroids towards the thorn tufts is likewise seen here, as in the flat part of the trunk of *Epiphyllum phyllanthus* (fig. 4). The joints of the stem or branches of the *Opuntia* are perfectly compressed, and that in such a manner, that the woody bundles are situated remotely from each other (fig. 5). Where the stem of the *Opuntia* is round, there it has the internal structure of the *Cactaceæ* in general, a thick bark, and woody bundles separated from each other (figs. 6, 7). The spiral vessels and spiroids also ramify towards the tufts of thorns in the *Cereus flabelliformis* (fig. 9); the fluid distension is, however, principally owing to the enlargement of the bark, which is much thicker than the pith (fig. 9).

Dcaisne, in his Mém. sur le Developement du Pollen, de l'Ovule, et sur la Structure des Tiges de Gui, Bruxell., 1840 (Exte. du t. xiii. de l'Academ. R. de Bruxell.), has communicated some observations on the Stem of the Mistletoe (*Viscum album*). He first alludes to the remarks made by De Candolle, Kaiser, and Dutrochet, respecting it. Dutrochet asserts, that each joint of the stem grows independent of another; that

the woody substance of each joint is separated from the other by a layer of cellular tissue ; and that the joints are only connected with each other by the bark. Decaisne, on the other hand, says, that on the contrary, the bark vessels are not connected with every joint, and that the latter, on that account, readily separate from each other, but that the woody bundles are not separated from each other at the nodes ; he failed to detect a layer of cellular tissue between them. Eight bundles of long fibres, he says, are observed about the pith, which exhibit all the characteristics of liber ; these bundles correspond exactly with the internal part of the woody bundles, and next to them, and even in the wood itself, ringed vessels are found, which here seem to occupy the place of the spiral vessels. These ring vessels have escaped Kaiser, at least he does not speak of them. The mistletoe has no genuine spiral vessels, nor are there any traces of a membrane by which they are connected, nor are such vessels found in the nerves of the leaves. The number of woody bundles is constant in the young twigs, generally eight, seldom seven or nine ; each bundle consists of three zones, the most external belongs to the liber, or to the fibrous cells of the bark, the second to the wood, and the innermost is formed like the external.

What the author calls ring vessels, *vaisseaux annelés*, are not generally so called ; there are genuine spiral vessels, the spires of which do not join one another, and in which the membrane enclosing them can be distinctly perceived. Many Botanists would certainly not agree with him in the supposition, that there are spiral vessels which are entirely deficient of that membrane ; and it is still less correct, to assume that circumstance to be a characteristic sign of spiral vessels. The more or less closely connected spires are likewise of no particular importance, and deserve as little to be ranked among the characteristics of spiral vessels. The substance which the author calls liber, certainly seems to deserve this appellation ; the wood, however, in this plant is of a peculiar quality, which will be explained on another occasion, as we shall, further on, allude to the otherwise excellent researches of the author on the mistletoe.

In Forriep's Neuen Notizen, vol. xiv. p. 242, we find *Von Hall's Observations on the Increase of Trees in Thickness*, read at the Royal Institution of Sciences of the Netherlands, &c., first class. The observations were made on the oak, willow tree (*Salix alba*), Canadian poplar (*Populus monilifera*), horse chestnut, birch, maple (*Acer pseudo-Platanus*), lime tree, fir tree (*Pinus abies*), and the walnut tree. I will pass over these observations, as the relative growth of these trees depends much on the soil in which they grow, and the observations only refer to trees in the same locality. The author has frequently made the observation, that the increase of growth, in point of thickness, is considerably lessened by the tearing off of the foliage, and the taking off of many and strong boughs, which is opposed to the opinion of the advocates of pruning trees. The author further instituted investigations on the increase of thickness in different months of the year. The tables on this point exhibit a proof, that the growth of trees in Holland is very variable, which no doubt is owing to the weather and temperature of that country. As a general rule, however, we learn, that the months of June and July are those in which the trees increase most in thickness, for the growth in these two months, in most cases, exceeded that of all the other months put together. The author did not observe a suspension of growth of trees from the latter half of June to the middle of August, as recorded by Duhamel for France; this is unquestionably owing to the fact, that there is no dry season in the summer in Holland. The opinion of Agardh is unfounded, that trees grow more in length in the first part of the summer, and more in thickness in the latter part of it. Trees do not increase in thickness during the winter months; the buds, however, thicken. The branches of birch, maple, and other similar trees, are seen to be filled with rising watery juices in March and April, if the weather is mild, which cannot be perceived so much, or not at all, as soon as the weather becomes warmer. These juices, however, have no influence whatever upon the increase of thickness in a tree. The superabundance of this rising juice decreases as soon as the leaves have perfectly shot forth,

which seems, therefore, to be more concentrated in the leaves; and the growth of trees, in point of thickness, only commences after the leaves are capable of fulfilling their functions: this has been proved by all the measurements which the author instituted. The influence of the leaves upon the increase of trunks, in point of thickness, exhibited itself, among others, most distinctly in the Italian poplar. On one of these trees being deprived of almost all its branches, in the month of March, the increase in thickness was proportionably slight during the months of June and July. The growth of a lime tree, on the other hand, in which the side branches, also those lower down on the trunk, as well above as beneath the point of measurement, had, for the greater part, been purposely left, was considerable, and increasing every year. An experiment was made with two equal sized oaks, situated under the same circumstances, all the lateral branches were taken from one and left in the other; the result was, that the increase of thickness, in the tree which had not been pruned, was much more considerable than of the one which had been pruned. The trunks of *Monocotyledons* also increase in thickness according to the observations of the author. An *Aletris fragrans* had increased by $17\frac{1}{2}$ millimeters in thickness in five years, and a trunk of *Dracaena draco*, by $23\frac{1}{2}$ millimeters in the same period of time. These excellent observations confirm the theory which Thouars has advanced, respecting the increase of trees in thickness, which I have endeavoured to represent, at least in its principal features, in the elm. Phil. Bot. ed. 2, vol. i. p. 260, and in the Icon. Anat. Bot. part i. p. 7, fig. 10-12.

In addition to the account formerly mentioned, of the dying of wood, and rendering it durable, by Dr. Boucherie, we have now to add the Report of the Commission of the Academy, consisting of Mirbel, Arago, Poncelet, Audouin, Combe, Boussingault, and Dumas (Compt. Rend. 1840, vol. ii. p. 894). It is not necessary, they say, that the tree should have all its branches and all its leaves, it is only requisite to leave a tuft at the point, in order to effect the imbibition. It is not requisite that the tree should remain standing, it may

be cut down, after having previously taken away all its useless boughs, and must then be placed with its lower end immersed in the fluid which is intended to be absorbed. If it should not be desirable to cut down the tree, it is only necessary to make a hole in the trunk below, or to make an incision with a saw, and then to bring the fluid in contact with it. The permeating of the stem is effected in a few days without difficulty or labour. In order to make the wood more durable and harder, pyrolignite de fer should be made use of for imbibition. The pine-wood acid is brought into contact with iron shavings, the combination takes place even in the cold, and then contains much of creosot; and the latter, as is well known, is a preservative of all organic substances. In order to prevent the warping of the wood, Boucherie uses chloride of lime, or the lye of the places in which salt is prepared. It has already been stated, that wood may be died by causing fluids to pass into the tissues of trees, which, by their chemical effect upon each other, produce colours.

M. Payen has read a treatise at the Academy of Sciences in Paris, on the *Leaf-nerves of the Dicotyledons*, which has been criticised by De Mirbel; the critique is contained in the *Annales des Sciences Naturelles*, 2d Sér. Botanique., v. 14, p. 220, and in the *Comptes Rendus*, 1840, v. 2. The treatise is praised on account of its practical applications. The author first considers the origin of the nerves from the vascular bundles of the wood in the branch, and enumerates three different kinds of origin;—1st, The unitary, if they spring from one vascular bundle: 2d, The ternary, if three vascular bundles unite in order to form the leaf-nerves; and, 3d, The circulary, if the vascular bundles meet from the whole circumference of the wood. The vascular convolutions frequently run through the petiole of the leaf to the leaf, without experiencing a change, but frequently each divides itself into three fibres, which then either enter into the leaf on the same surface as the principal nerve, or on different surfaces. The simple leaf is produced, if the central vascular bundle separates itself from the wood at an earlier period than the two others; if, however, the two lateral bundles liberate themselves first, then

a *folium lobatum*, or *stipulatum*, or even *compositum*, 'is produced. If one of the two lateral bundles is separated earlier than the other, and earlier than the principal nerves, then the side of the leaf, where this happens, is always more developed than the others. If the curvature, which measures the distance of the central nerves to the side nerves, at that point of the branch where the bundles separate from the wood, is very large, then the leaf is generally lobed and stipulate.

The epilogue of Mirbel is singular. The labour, he says, was obliged to be done, it was necessary for science; it is well that it has been done with diligence. Good fortune has frequently a greater share in making important discoveries in the experimental sciences than cleverness. The phytologist, who has recourse to anatomy, can derive no more from the object than there is in it, however industrious he may be. M. Payen is not wanting in capability, he only wants the opportunity. Mirbel wished to say, What is the use of accuracy in research, if the variety discovered is not brought into combination with the whole? They are preparatory labours for the fortunate man who discovers their combination.

The Leaves of the Coniferæ appeared to me so remarkable, that I subjected them to an examination; the description of which is to be found in the *Icon. Select. Anat. Bot.* part ii. tab. 5, (1840.) They are principally distinguished by only having an ordinary simple (sometimes, however, perhaps a double) vascular bundle, which runs longitudinally through the leaf, without producing branches or ramifications. The *Folium acerosum* might be thus characterized. They generally also have one or two resinous channels, which run through the whole leaf; the leaves of *Abies balsamea* have them at the sides (fig. 9); the leaves of *Thuja occidentalis* and *Juniperus communis* (figs. 11 and 12), have only one resinous channel near to the principal nerves. Many have a double upper layer, as, for instance, *Abies balsamea* (fig. 9, *ee*), and *Juniperus sabina* (fig. 10, *cc*): the cells of some of them are also lengthened laterally, beneath the upper layer, as, for instance, on the upper surface of the leaves of *Abies balsamea* (fig. 9, *cc*). The form of the leaves of *Thuja occidentalis* is strange,

the nerves are so ramified, not only amongst each other, but also with the branch, that only one woody bundle goes through the branch in the middle.

ROOTS AND TUBERS.

A Note upon the Anatomy of the Roots of Ophrydeæ, by John Lindley, Tr. of the Linnean Society, vol. xviii. part iii. p. 423. The author says, that the tubers which form the roots of many African *Ophrydeæ*, on becoming dry, have the appearance of sacs, filled with small pebbles; the surface is coarsely grained, as if the epidermis was firmly contracted over hard substances. This may be seen particularly in the dry spindle-like roots of *Disa multifida*. On cutting across a fresh root of *Satyrium pallidum*, it will be seen distinctly whence this appearance arises. A great quantity of oval, tough, and solid nodules, clear as water, and frequently twenty times the size of the cells which surround them, are found in the tender parenchyma. These nodules may readily be separated from the cellular tissue in which they are situated, and they appear to be of an irregular polygonal shape, like polished stones of rock crystal. Their facettes are produced by the pressure of the cells of parenchyma between which they are situated. They are tough like horn, cannot be torn, crackle between the teeth like pieces of caoutchouc, may readily be cut even into slices, and then appear quite homogeneous; they do not exhibit any layers either in a fresh or dried state, or when treated with chemical reagents. They are generally of the same size, but some are not larger than the ordinary cells of cellular tissue. The nodules are scarcely soluble in cold water, but swell upon being boiled, and are partially dissolved into a transparent jelly, having the appearance of glass. On exposing them to the air, they rapidly become dry, and of a dark brown colour. The diluted solution of iodine does not perceptibly act upon them, but the tincture of iodine gives them a claret colour, on being previously treated with caustic potash, or nitric, or sulphuric acid. The diluted solution of iodine colours starch

granules blue, but has not that effect upon these nodules; the tincture of iodine, on the other hand, gradually colours the nodules of an amethyst colour; they then become claret coloured, and, on an incision being made into them, this colour gradually distinguishes itself. These colours, however, soon disappear again, especially if there is a warm temperature; no trace of blue can be detected. The nodules, therefore, are not starch. The roots of all other *Ophrydeæ*, European or otherwise, which the author had an opportunity of examining, were formed, in every essential point of view, like those of *Satyrion pallidum*. The only points of difference presented, were the size and the shape of the nodules, and the relation which they bore to the surrounding cellular tissue, and the colour which the nodules assume when exposed to the air. On crushing the nodules, it was found that they consisted of very small transparent cells. The author endeavours to explain the reasons which induced Guibourt and Payen to describe the *Salep* as consisting principally of starch, and is of opinion, that they boiled the tubers of *Salep* and afterwards dried them again. By this process he supposes the starch to have been dissolved, and to have flowed over the nodules, thus rendering them incapable of being recognized. He adds, The principal characteristic of the tubers of *Salep* does not owe its origin to the starch, but rather to that gummy-like substance which for the present he would call basserin. The remarks of the author deserve attention. It is well known, that the powder of the tubers of *Salep* swells in cold water, which granules of starch do not. Besides the starch, there is another substance likewise found in the tubers of *Salep* and other *Orchideæ*, which is not coloured blue on the application of iodine. This is found in the nodules of the author; into the investigation of this substance I did not enter at the time. Unformed starch, the same as if the tubers had been boiled, I have seen in the fresh roots of *Orchis latifolia*, which I have alluded to before. I must leave it open to discussion, as to whether the *Salep* roots, that are sold in the market, are boiled, and afterwards dried again.

FLOWERS.

M. DECAISNE treats of the *Development of the Male Blossoms of the Mistletoe* in the above-mentioned memoir, respecting the pollen, the ovules, and the stem of the mistletoe. On making a transverse incision quite through a young flower, slices were obtained, which, in the same manner as the vessels, are separated into four divisions. A layer of cellular tissue forms the external circumference; this is followed by a green matter, mixed with granules, which have a strong molecular movement, and an uncoloured tissue is situated in the centre, against which the green matter makes four projections. The green matter some time afterwards was distinctly seen separated into four parts, each consisting of two halves, an external green half belonging to the calyx, and an internal paler coloured one from which the anthers were produced. The green part gradually increased, and shot forth prolongations into the inner part, which crossed through it. On examining each of these four parts separately, clearer spots were perceived in them, which were spaces filled with mucus matter; the cellular tissue which forms the walls of these spaces contains many small granules, and some of them also contain a nucleus of a lentil-shaped form, which the author calls a *phakocyst*.* The mucus in the spaces, upon being submitted to a greater degree of magnifying power, subsequently exhibited round, transparent, large cells, which the author, as well as Mirbel, calls pollen cells (*utricules polliniques*). These pollen cells some days afterwards cease to be transparent, and one, or sometimes two, oval nuclei are formed, which consist of small granules. The pollen cells, about five days afterwards, become again transparent, the granules being concentrated in one mass in the centre. They are still surrounded by a mucus substance. Thus the pollen cells remain for some days; four

* From φακός, lentil, and χύστη, bladder. The name, says the author, seems to give a more correct conception of the characteristics, "sans rien prejurer de ses fonctions," than the term of *Cytoblast*.*

phakocysts are subsequently discovered in the centre of the granular mass, each with a clear central point. The granular mass disappears after some time, without any of the phakocysts becoming enlarged. At last, in the middle of the month of August, four months after the commencement of the observations, the vegetable cells exhibit themselves as consisting of concentrated layers, with a cavity in the middle, in which the four commencements of the pollen grains appear surrounded by a liquid. They gradually increase in size, and the thick pollen cell, consisting of layers, finally disappears altogether. The pollen cells in the *Malvaceæ*, at least in *Hibiscus syriacus*, have already a considerable thickness, before we can perceive the commencement of the pollen grains, because the matter within them is clear as water. It only afterwards, when it forms new products, becomes granular, for the first traces of phakocysts are subsequently discovered in the granular matter. The granular matter subsequently separates itself into four masses, which contain a phakocyst; and a clear ring is seen round each of these four masses, which shows that they do not altogether fill up the pollen cell. The pollen cells have a covering, consisting of layers, like the starch granules, and they also shoot up in a similar manner, on placing them in a drop of water. The membrane of the pollen cells, according to the opinion of the author, is not produced from the internal surface of the pollen cells. The author adds,—“The anthers of all flowers first attain their essential characteristics, when the other flowering organs are scarcely perceptible. On rolling young pollen grains between two glass plates, their external membrane is not removed, but the granules are torn, and their phakocyst escapes; on the other hand, the external membrane of ripe pollen grains is easily separated, and the internal cell contains only granules, but no phakocysts.”

*IMPREGNATION—OVULE—SEED.

WE shall here proceed with the researches, which M. Decaisne has instituted, respecting development in the mistletoe. On

examining the ovary in its earliest state, it presents a uniform mass, with two small interruptions of the cellular tissue; the cells, however, soon unite again, in order to form a clear cellular tissue in the centre, surrounded by a green circle. No ovule is perceived in the ovary for a long time, not, as far as the commencement of June, when the ovary has the thickness of a pepper corn. At a little later period, however, an ovule may be discovered; the easiest method of effecting which is, to separate the central substance into two parts, which is best done by gently drawing it to and fro. The ovule forms a club-shaped excrescence, the cellular tissue of which is arranged in concentric layers; each cell contains two phakocysts. On subsequently bringing the ovule, when it has assumed the shape of a small, rather compressed substance, in contact with a drop of water, the water will penetrate it, and drive out the phakocyst with some force. The application of a drop of tincture of iodine colours the interior yellow, but leaves the granules uncoloured, which only subsequently become coloured when iodine is applied. Two thin club-shaped bodies are found next to the ovules at this epoch, and some weeks earlier, three fibrous bodies, rather thickened at the end. The author considers these bodies as abortive ovules. The ovule, which is thin at the lower end, might be compared with an embryo sac, if the position of the surrounding vascular system, and the comparison with the other parts of the fruit, did not contradict it. The young embryo exhibits itself, as a small mass of cells, at the point of the ovule, and nearly in contact with what one might call the epidermis. The author never observed a trace of a pollen sac in the interior of the ovary, nor did he ever discover the slightest indication of a special integument for the ovule; so that the latter exhibits nothing more than a nucleus, as has been observed in the *Santalaceæ*, and even in the *Olacineæ*. This nucleus is attached, by its base, to the bottom of the ovary, and has its point exactly in the opposite direction, so that the ovule must be regarded as orthotropous. When the ovule has attained such a size that the embryo becomes visible, together with the fibre on which

it hangs, it assumes a green colour, for it was previously uncoloured; and this green colour spreads itself from below upwards, as far as the embryo, which remains uncoloured. The starch granules also become larger, and almost entirely fill up the cells; but the phakocysts remain unchanged. Besides the green colour of the mistletoe seed, another circumstance has attracted the attention of Naturalists, namely, that two or three embryos almost always occur in one seed. The author was fortunate enough to observe ovules several times in various stages of growth, and saw that the union of the ovules commenced at the base and progressed upwards, by which, therefore, the polyembryony of the mistletoe became explained. The author never saw a cavity in the ovule of the mistletoe when the embryo was forming, neither did he ever find an embryo sac. The embryo exhibits itself, first, as already mentioned, at the upper end of the ovule or nucleus; and the embryo cell, or the young embryo itself, is subsequently seen to be attached to a series of cylindrical cells in the cavity of the ovule, which cells constitute a kind of umbilical cord, but without a vascular system.

Observations on the seed of *Loranthus aphyllus*.—A small conical mass is seen at the upper end, in a similar ovule to that of the mistletoe, which is more dense than the surrounding cellular tissue; from this substance issue four tender tubes, which twist themselves round each other, and, in a manner, form a spiral vessel, almost in the same kind of way as Treviranus observed in the ovules of *Abies*. An oblong body, the embryo, is subsequently produced at the lower end. If several embryos are existing in one seed, they always appear at the upper and lateral part of the nucleus. The separation of the embryos in the ovules is, in the first instance, caused by the united ovules being either of an unequal size, or by one growing more rapidly than the other. If the ovules are, however, of an equal size, the embryos then first turn themselves obliquely towards the axis of the nucleus, and afterwards, as soon as the cotyledonary ends touch each other, the latter turn round, and are directed towards the point where the ovule is attached. The author explains the circumstance of the embryo shooting

forth from the nucleus, by supposing that the former, when in the act of enlarging itself, is forced out by the resistance of the already formed nucleus. The author never saw more than three embryos in one seed. He observes, that the circumstance of the fructifying fluid retaining its power so long can scarcely be comprehended, when the long interval is considered which intervenes between the opening of the blossom and the appearance of the embryo. This is observed in other plants; and Ad: Brongniart is, therefore, of opinion, that the embryo remains for a time in a sort of torpor before it develops itself. But, says the author, this cannot be applied to the mistletoe, because the ovules are not only not organized at the time of blossoming, but they have not even a cavity for the embryo. The author then makes some observations on impregnation in general. He says, pollen sacs exist in some plants; but in others, where papillæ are situated upon the ovule, as in the *Aroideæ*, they have never been observed, and the papillæ seem to be substituted for them; in other plants again, little bands (*bandelettes*) descend from the basis of the style, and are deposited in the seed near the micropyles; for instance, in the *Compositæ*, and in some others. Finally, he speaks of the position of the species of *Viscum* in the natural system; the author, with Robert Brown, places them in the *Apetalæ*, beside *Loranthus*, and next to the *Santalacæ*; *Schoepfia*, however, must be separated from this, and placed amongst the *Olacineæ*. Three tables illustrate the researches of the author.

With this we must notice *Some further Words on the Act of Impregnation, and Polyembryony in the Higher Plants*, by F. J. F. Meyen; Berlin, 1842, vol. ii. p. 50. The author first details facts, and then argues against Schleiden's theory of the embryo forming itself from the pollen tube. The point of the embryo sac, according to his researches, combines itself with the pollen tube, and the embryo proceeds from this union, and, in many cases, appears as a double germinal vesicle. The observations related in this part of the treatise, were made upon the *Mesembryanthemum pomeranianum*, and may be considered as an epilogue to the statements made

on this subject, in the third volume of the author's physiology. He then speaks of polyembryony, and gives a description of the development of the ovule in the mistletoe. There is no particular pistil, he states, in the mistletoe, and, therefore, likewise no real ovarium; the ovule is a mere naked nucleus, the point of which is free and projecting, and at the same time serves as a stigma, as it is the immediate recipient of the pollen. A cavity is produced in this nucleus, and within it the embryo sacs, of which there are often two or more, exhibit themselves in the middle of April. It is then that the embryo develops itself. The author did not observe any pollen tubes.

It is evident, that what the author terms embryo sacs, Decaisne describes as ovules. The examination of these ovules has been instituted with much greater care by Decaisne, and if Meyen had continued his researches long enough, he no doubt would have been convinced of his error. He likewise did not think of the pericarpium, nor of the berry. Meyen always aimed too much at novelty, at producing a striking effect, and endeavoured, in this way, to outdo his antagonists. This statement should be compared with the author's explanation of the peculiar position of the embryos in the mistletoe seed, when several of them occur in one and the same seed, in Wiegmann's Archiv for 1840, vol. i. p. 164, in which he has well observed the union of the embryos with their cotyledonary ends.

Goeppert enumerates an instance of polyembryony in *Thuja orientalis*, in the Report of the Labours of the Silesian Society for Native Culture, 1840, p. 99.

M. Arndt, of Osnabrück, has instituted observations (Flora, 1840, p. 477) on the Impregnation of the Flowers of *Lopezia mexicana*. The anther burst on the inside towards the stigma; the place where the anther-valve is about to open is indicated by a glittering longitudinal stripe. The bursting of the valve takes place when the petals of the corolla are still entirely closed, which is, however, perfectly developed in all its parts. After the bursting, the filaments increase in size, turn round and round, and finally throw off the emptied pollen tubes.

Remarks on the Impregnation of Plants are also found in the *Journal de Pharmazie*, 1840, p. 751, by M. Fromond; see also *Flora*, 1841, p. 204. He particularly treats of the cases where the stigma is situated above the anthers. The author is of opinion, that wind or insects are not always required to facilitate the impregnation; indeed, he does not even consider it philosophical to have recourse to these modes of explanation in such cases. Impregnation, according to the author, only takes place some time after the opening of the flower, and when the corolla twists itself on the approach of the period of withering. This is the case in *Iris*. The pollen here precipitates itself upon the basis of the style on the bursting of the anther; the parts of the flower afterwards become erect, and bend themselves towards the centre of the flower, and thus the pollen is sprinkled upon the stigma. The same process also takes place in *Sisyrinchium* and *Moræa*. The flower in *Ipomæa* and *Convolvulus* is twisted into a spiral form after the bursting of the anther, and completely encloses the style; the corolla is afterwards loosened at the base, and glides down on the style by the slightest motion of the air, and the pollen situated upon it thus comes into contact with the stigma. The anthers in the *Malvaceæ* strew the pollen about far and near in the morning, so that it is partially precipitated upon the petals, which latter are brought towards the centre of the flower in the evening, thus enabling the pollen lying upon them to come into contact with the stigma. Many flowers are twisted in a spiral form, so as perfectly to enclose the stigmas.

M. Treviranus made *Remarks on the Hairs on the Style of the Species of Campanula* (see *Flora*, 1840, p. 680), to the Assembly of Naturalists at Erlangen. He agrees with Ad. Brogniart in the opinion, that impregnation in these plants is effected in the usual way, by pollen tubes, which he found upon the stigma. Brogniart found that these hairs did not fall off, but drew back into a sheath, like the claws of a beast of prey; which Treviranus confirms. The latter found pollen-globules within the cavity of the hair itself; they therefore cannot have come into the hair accidentally, as Brogniart believes.

Treviranus has likewise observed, that a cavity is situated beneath these hairs, which penetrates into the style, without, however, communicating with the conducting cellular tissue.

The Style Hairs of Campanula medium have been represented in the Icon. Anat. Bot. tab. 21, fig. 1 and 4. It can be seen, that a channel enters from the hair into the style, without, however, being connected with the duct of the style. The drawing back of the hair I did not find; but it appears to me, as if the fore-part of the hair lost itself in and sunk into the lower. There were tubes similar to pollen tubes in the style, but forced together, and before the opening of the anthers (fig. 1). The duct of the style is closed below both before and after the opening of the anthers, but open above (figs. 2, 3). Pollen tubes were seen in the duct after the opening of the anthers, and differ from the lengthened papillæ with which I placed them in the explanation of the figures; they are also thus delineated, as the few papillæ strewed about in the duct may have got into it by the incision. It is singular, that pollen tubes should have been found in the duct of the style before the bursting of the anthers; but this requires further investigation.

Pollen tubes, in the state in which they penetrate the ovule, are illustrated in the Icon. Anat. Bot. part ii. (1840), tab. 8. The micropyle of the ovule of *Mesembryanthemum glomeratum* is much larger than the entering pollen tube (fig. 2), and no trace could be perceived of an opposing embryo sac, or of any other change taking place within. The same was also the case upon the penetrating of a pollen tube into the ovule of the *Hohenbergia bilbergioides* (fig. 3); each ovule in the ovary was provided with such a pollen tube. The pollen tubes of the same plant, as they are produced from the pollen grain, are represented, fig. 4, in which the perfect correspondence between the tube, which forces its way into the ovule, and the sac which has just been developed, may be observed. Fig. 5 exhibits two ovules of *Gymnadenia conopsea*, into which pollen tubes are entering. The integument of the ovule is so tender and transparent, that the absorption of the sac, as soon as it has entered, may be distinctly observed. The

pollen tube does not always exactly hit upon the opening of the ovule; thus it is seen at the edge of the micropyle in fig. 6, in an ovary of *Matthiola annua*. The manner in which the pollen tubes penetrate through the cellular tissue of the duct of the style is represented in fig. 6, from *Nicotiana tabacum*. They take the shortest road to get from the cellular tissue into the cavity of the capsule; but no entering into an ovule could be perceived.

The Germination of the Orchideæ I have attentively observed in *Angræcum maculatum* and *Goodyera procera*, and it has been represented in the Icon. Anat. Bot. part ii. (1840), t. 7. That which I have seen is so different from the germination of all other *Monocotyledons*, and corresponds so exactly with the germination of the (bulbilli) bulbous buds which are found on many *Liliaceæ*, that I hold the seed of *Orchideæ* to be a bulbillus. It is well known, that the seeds of many of the species of *Pancratium* are converted into bulbilli, which, though not the same, is certainly a similar occurrence. For the sake of comparison, I have given, in the sixth table, an analysis of a bulbillus of *Lilium bulbiferum*. I had already kept the delineations of *Angræcum* for some time, which M. Schmidt had executed with his usual ability and exactness, but thought, however, that it was an accidental change of the seed, until I had an opportunity, not only of observing very accurately the germination in *Goodyera*, but also of observing that no contradictory circumstance is perceptible in the *Orchideæ* generally, which are already further advanced in the process of germination. The seed of *Angræcum* first exhibits itself with two points (fig. 1); from which, as subsequently seen, the stem and a small root develop themselves (fig. 2). On cutting through the seed, when in that state, longitudinally, a bundle of spiroids will be found in the centre of the cellular tissue, which occupies the whole seed (fig. 3). On cutting through the seed, bulbillus, or whatever one pleases to term it, after the germination, we find that it is but little changed, a bundle of spiroids is seen going laterally into the root (fig. 4). *Goodyera* is similar. The seed, after it has commenced to swell and to germinate (fig. 8), has its exterior shape in the

same state as it had in the testa (fig. 7), proving that it does not experience any material change by germination, nor is it converted from a genuine seed into a bulbillus. It was impossible even for M. Schmidt, who certainly possesses great ability in making fine incisions, to do this with the seed when situated within the testa, but it was easily done in the seed which had just begun to germinate. A bundle of spiroids was likewise found to be here situated in the centre, and every thing else was filled up with cellular tissue (parenchyma). The cells in the circumference contained chlorophyll; the cells towards the centre, however, dark granules—phakocysts, as Decaisne terms them (fig. 10). A fine longitudinal incision was made, after the embryo had advanced so far as to exhibit two perfectly developed leaves (fig. 9). It exhibited little change from the former; the bundle of spiroids had enlarged, and separate vessels entered into the leaves. The number of the chlorophyll cells had rather decreased than increased, and the phakocyst had dissolved itself into small granules (fig. 11). Instead of a large root, as *Angræcum* exhibited, only fine root-leaves, which surrounded the nucleus, were found. On making a longitudinal incision through a bulbillus of *Lilium bulbiferum*, a bundle of spiroids will likewise be found in the centre of the cellular tissue, from which the separate vessels are given off upwards into the layers of the bulbillus (fig. 11). The only difference is found in the fact, that the seed of these *Orchideæ* is quite naked, whilst the bulbillus is enveloped in leaves, as may be seen in the transverse section (fig. 10). Three roots are always attached to the *Lilium bulbiferum* (fig. 12); which usually have a bundle of spiroids in the centre, without pith; spiral fibrous cells, however, are seen in the circumference, similar to those in the aerial roots of the *Orchideæ*.

ANOMALOUS PHANEROGAMIÆ.

A. PARASITES.

UNGER has made some excellent contributions to our knowledge of Parasitical Plants in the Vienna Archiv for Natural History, vol. ii. (1840). After having given a general sketch of the different opinions on parasitical plants, and of the literature of the subject, he proceeds to the different classifications of these plants. On commencing at the lowest of them, he states, we shall find the parasite united with the plant that gives it nourishment, in such a manner, that it shoots forth immediately from the wood of its supporter, and its vascular system anastomoses with the vascular system of the nourishing plant. This is seen in the species of *Rafflesia*, *Brugmansia*, *Pilostyles*, and *Apodanthes*, perhaps also in *Cytinus*. An immersion of one substance into the other, without any intermediate aid, is perfectly recognisable here; the lowest part of the parasite is, in a manner, wedged into the nourishing plant; its parenchyma exactly joining itself to the parenchyma of the bark of the nourishing plant, and the vascular bundles of the former are attached separately to the parts of the wood separated by the medullary ray. 2d, The parasite forms a sort of root-stock, by which it adheres to the nourishing plant, and from which it sends forth several flower stalks. 3d, A part of the vascular system of the nourishing plant is received into the root-stock of the parasite, and by means of an increased reaction (probably produced in the same way as germination), a substance is thus formed, which belongs both to the parasite and to the nourishing plant; *Balanophora*, *Cynomorium*; *Cynopsale*, *Sarcophyte*, *Lophophytum*, and *Ombrophytum*. 4th, The parasite forms a root-stock, the fibres of which attach themselves to the nourishing plant; *Helosis* and *Længsdorfa*. 5th, No root-stock is formed, but strongly ramified roots, which are connected with the mother plant through means of papillæ; *Lathraea squamaria*. 6th, Inoculation of the

parasite, as in number 1, but with the addition of roots, which are provided with papillæ, which soon disappear; *Orobanche*, *Phelipaea*, *Chonopholis*, *Hyobanche*, *Epipheagus*, *Æginetia*, and *Obolaria*. 7th, The bulb-shaped irregular substance, similar to a rhizom, from which the flower-stalks of these plants spring, consists of a bundle of intimately matted together root-fibres, which partly belong to the parasite, partly to the nourishing plant; *Monotropa hypopithys*. 8th, The parasite develops itself independently, and only here and there occasionally shoots forth from the stalk into the nourishing plant; *Cuscuta cassytha*. 9th, Strongly ramified roots, which extend themselves both over and under the bark of the nourishing plant, and are in a manner infiltrated into the same; *Viscum*, *Loranthus*, *Misodendron*, &c., &c.

The author has added many facts respecting the anatomy of these plants: Thick walled cells frequently occur in the form of bundles, which are longitudinally extended, and provided with partitions. The application of a strong magnifying glass distinctly exhibited thirteen layers in the *Helosia braziliensis*, and even thirty layers could be distinguished in the *Langsdorfia hypogæa*. The channels which cross through the layers in all directions, could also be distinctly perceived. These layers are very unequally deposited; and in such a manner, that one side appears free from deposit, whilst the other appears to have an accumulation of them. The vascular bundles of the *Rhizanthaceæ* may be considered as remarkably small and insignificant; they consist of only two vessels, and the thick walled cells accompanying them. The vessels, without exception, belong to the reticular, porous, and scalariform vessels, never to the simple or ring-formed spiral vessels. In general, the vessels of the *Rhizanthaceæ* consist of short longitudinal tubes in the shape of a leather pipe, which are irregularly placed one above another, and are placed in continuation with each other by the partial absorption of the intervening walls. We also perceive in the vascular bundles, especially in the *Cynomorium* and *Helosis*, that a peculiar homogeneous matter, which is soft and of a brown colour, is deposited in larger or smaller irregular bars and nets. The

Vegetation he considers to be his vegetatio terminalis, as exhibited in the ferns. They are not *Monocotyledons*. Independent of the circumstance, that no anastomosis of the vascular bundles takes place in the *Monocotyledons*, which is distinctly seen in the *Rhizanthaceæ*, there is another fact which is opposed to this supposed mode of vegetation of the vascular bundles, and that is, that the curvature towards the outside is never perceived. Observations are then added respecting the anthers of parasites. The club-formed swellings of the columna genitalis, in the *Pilostyles*, cover, at the lower side, from two to three rows of simple pressed tubes, flattened at the points. The anther, in *Brugmansia*, consists of four tubes; in *Rafflesia*, an indefinite number of long drawn tubes are found, which all bend together upwards, and scatter their contents about through a single opening. The anthers in *Hydnora* consist of longitudinal tubes, which open themselves longitudinally; an indefinite number of blunt conical tubes, entwined with each other and united into a little head, are seated on a thick foot-stalk in the *Sarcophyte sanguinea*; the upper free wall of these tubes bursts at the period of ripeness; the bursting is effected by the elasticity of striped vascular cells. The anther tubes in *Hydnora* have quite a similar structure. The author finally treats on the relationship of parasites with the fungi, with which they certainly correspond in many respects. The author's statements are illustrated by seven tables, which are a valuable contribution to our knowledge of these plants.

There is no doubt, that all parasitical plants belong to the *Dicotyledons*. The vascular bundles certainly do not often form a ring, but stand separated in one circle, which is also the case in many weed-like *Dicotyledons*; they are never, however, situated in several circles, as is the case in the *Monocotyledons*. I am not inclined to agree with the author, when he says, that the latter exhibit no anastomosis of the vascular bundles; this is frequently the case with the nodes of the grasses; the bending towards the outside is by no means a rule with the *Monocotyledons*. Many *Rhizanthaceæ*, according to the representation of the author, appear to have

the structure of a root-stock; for instance, compare with them the root-stock of celery (*Apium graveolens*). The thick walled cells most probably belong to the vessels or cells of the liber. The author, in this instance, also limits his conception of spiral vessels to such as may be unrolled, and which exhibit no membrane between the spires. I will not be positive that this membrane always exists, or that it is frequently wanting; but I have mentioned once before, that I would not like to consider it as a characteristic, nor even the circumstance of their being unrolled, for the latter may be occasioned by the stronger or slighter union of the spires themselves, or by the greater or less strength of the membrane between them. In my opinion, there are only two kinds of spiral vessels; one where the spiral-formed windings are exhibited in the form of a band, and the other where there are porous vessels with round holes or transverse bars. We have before noticed the treatise of David Don respecting the *Cycadææ*, in which he says he had saturated porous vessels with tincture of iodine, and found that the openings were coloured; and thought this a proof that they were overspread with a tender membrane. I have frequently repeated this experiment since, but the result was just the reverse; the pores were not coloured at all, but were always distinctly seen as genuine openings. If Mr. Don did not see this, it must have been owing to his not having made sufficiently fine incisions, when, consequently, a membrane was left beneath, which closed up the opening. The circumstance of the bars being seen as dark stripes, originates in the reflection of the rays of light; this, however, is frequently so deceptive, that these bars may be considered as shortened spiral fibres or bands, as has occurred to myself and many others.

B. LEMNACEÆ.

CONTRIBUTIONS to the more intimate knowledge of *Lemna arhiza*, by J. T. Hoffmann, Wiegmann's Archiv, 1840, vol. i. p. 138. The author found this hitherto but little known or neglected species upon waters in the south of Holland, near Gouda. It is distinguished by its form; it is oblong or

round, almost flat above, but strongly arched below; it has no roots, and 0.05 inch long. A yellow spot is speedily discovered on the lower side, which rapidly enlarges itself, and produces a new plant, which remains combined with the mother plant for some time, so that the plants seem to be joined in pairs, but they are finally separated. This yellow spot, therefore, is a bud. *Lemna arhiza* floats about in this form, till the end of October or the middle of November. Dried leaves, intermingled with yellow granules, which latter are the winter buds, are then found in the mud of the ditches, upon which *Lemna arhiza* has been floating; these buds develop themselves in the ensuing spring. They are not so much distinguished from summer buds in *L. arhiza* as in *L. polyrhiza*; but they are smaller, of a yellower colour, and are triangular with rounded corners. These winter buds, in the other species of *Lemna*, are always without roots, and have, therefore, frequently been mistaken for *L. arhiza*. A slit is discovered, when more accurately observed, where the bud is about to develop itself, and in it the young buds are found to be lying behind and next to each other; the winter buds contain two buds of very unequal size, sometimes a third and fourth. The whole plant consists of parenchyma, has stomates on the upper surface, but the author could not find any nerves or vessels in the interior; he also saw no fructification. This is a valuable contribution to the knowledge of this misunderstood plant.

FERN S.

A DESCRIPTION of the germination of *Pilularia globulifera*, with relation to Bischoff's observations and corrections, will be found among the Botanic Aphorisms of Charles Müller; Flora, 1840, p. 545. After the capsule has been laying in the mud during the winter, it bursts in the spring in the shape of four valves, through which it discharges spores and sporules, which again produce new plants. The commencement of the germination he relates in the following manner:

—The hyaline globules of the albuminous substance develop themselves first in the interior of the spores; they swell, and, by so doing, the spores spring out from each other; through the opening thus made, a small hyaline vesicle first develops itself, which is soon followed by a second, and third, and fourth, all of which assume a crooked shape. The spores now burst into four lobes, and a green coloured material develops itself from the interior of them. The papillæ also now burst, and a green mass likewise issues from their openings. The author, in other respects, agrees with Bischoff. The fibres which Bischoff terms algoid or fungoid formations, the author considers as *Cotyledons*. In a supplement, p. 721, he is of opinion, that their office is to keep the spore above water, as it has become heavier by the pressing forward of the green matter. He likewise saw the bursting of the sporules, as he terms them.

How does the author know that the small globules are albuminous? Has he seen that they burst the spores by their swelling? Has he seen the bursting of the papillæ? His hasty determination, with regard to the albumen, induces me to put these questions.

On the *Structure of Isoetes lacustris*, by Hugo Möhl, Linnæa, vol. xiv. p. 181. The stem or root-stock has a double furrow, by which this species may be distinguished from the *Isoetes setacea*, Del., which has three such furrows, as Delile has observed.. The root fibres are situated in these furrows, of which the upper grow upwards before the lower; not as is usually the case in this kind of root-stock, where the lower root fibres break forth before the upper. Another peculiarity of this plant consists in the fact, that the external layers of the stem wither away, and are supplied by new ones from the interior. The white matter of the root-stock contains parenchymatous cells; the small central woody matter has, above, an oval, below, a half moon, convex, round form; and consists of a uniform mass of small, short jointed, roundish, very loosely combined tubes, with large intercellular channels and spaces between them; the tubes are covered with irregular spiral fibres and ring fibres. The vascular bundles extend

themselves from the woody substance, in all directions, and consist of tender, annular, and spiral vessels, and a few delicate oblong cells. The stem of *Isoetes*, like the other vascular *Cryptogamia*, has a vegetatio terminalis; the woody bundles do not form any layers with progressing age, but only lengthen at their upper end. With regard, however, to the parenchymatous part of the stem, the peculiarity is seen which we have mentioned before, namely,—that the whole parenchymatous substance is annually replaced by a new one, which developes itself in the circumference of the woody bundles, is forced towards the outside, withers, and at last decays altogether. The author says, in conclusion, “It must be regarded as very improbable, when the mode of germination of the other *Cryptogamia*, from which the germination of *Isoetes* certainly does not materially deviate, is considered, that these plants possess a real *Caudex descendens*. Since, however, the development of the root-fibres takes place in a descending order, and since the central woody substance, from which the vessels of the fibres are derived, extend themselves downwards; we have, perhaps, in *Isoetes*, an instance before us of the case, which is so distinctly exhibited by *Tamus communis*, namely,—that the lower part of the rising axis developes itself, in relation to its growth, in the same manner as an original *Caudex descendens*, without being so in reality.” It would have been desirable that the author should have examined *Isoetes setacea*, which is easier to be obtained than *Isoetes lacustris*; it grows after the root-stock has been dried for some time.

The remarkable phenomenon which M. Martens first observed at Löwen, in the botanical garden, that an intermediate species of fern grew where *Gymnogramma calomelanos* and *chrysophylla* were situated, has also been observed by Bernhardt in Erfurt (Ottos and Dietrichs Flora, 1840, p. 249 and 325). A fern has grown in the botanical garden of that place, which holds a middle rank between *Gymnogramma distans* and *chrysophylla*, species which are cultivated in the same garden, and had been frequently standing next to each other. The frond of this intermediate fern is

doubly pinnate, decreasing towards the upper part; the shape of the pinnæ and pinnate divisions, holds a middle rank between the shape of these parts in its progenitors. The white powder of *G. distans* is scattered about at the base of the fronds and the pinnæ, where they are attached to the foot stalk, and the yellow powder of *G. chrysophylla*, but rather paler, is seen on other parts. M. Bernhardt considers these forms as real hybrids; he recommends particular attention to the fructification of the fern in these species of *Gymnogramma*; he thinks, that if his assertion respecting the male fructifying parts of these plants should be confirmed, the phenomenon may be more readily explained, than if other parts are regarded as anthers. M. B. rejects the opinion too hastily, that the species of ferns, of which such intermediate forms have been observed, may be modifications of the same species; indeed, these species are very similar, and the ferns are by no means so constant in their forms as the author thinks; on the contrary, they change very frequently, and much more so than other plants. It is often the case, that we see long and short, pointed and blunt pinnæ, on one and the same frond of the larger *Polypodiaceæ*. I have characterized two kinds of *Ceropteris* in the list of the ferns of the Royal Botanical Garden at Berlin (*Filicum Species in Horto. R. Bot. Berolin. Cultæ. Berol. 1841*), which have been considered as hybrids, i. e., *C. Martensii*, alleged to be a hybrid of *C. calomelanos* and *C. chrysophylla*, and *C. Massoni*, a hybrid of *C. distans* and *C. chrysophylla*, which Bernhardt has mentioned. A *Ceropteris* is also described, which is an intermediate form between *C. calomelanos* and *C. distans*. The genus *Ceropteris* has its peculiar characteristics, not only in the singular hairs which secrete wax, but also in the distribution of the thecæ, which, like those of the *Gymnogramma*, are regularly placed in lines.

The author, in expressing his opinion respecting the anthers of the fern, says, they have generally been erroneously described, as the thickened ends of the leaf-nerves were mistaken for them, and this had probably been done for the sake of convenience, Sprengel's drawings having been followed without

paying attention to his treatise. This certainly has not been the case; the treatise he alludes to was published forty years ago, in a journal which attracted more attention, and had a greater circulation, than was the case with Sprengel's drawings. But on following the particular and elaborate illustration of the author, I first observed the thickened ends of the nerves, and also, more externally, granules, which I took to be the author's anthers, but which appeared to me more like excretions. I have frequently sought in vain for definite forms, and it was certainly owing to this that I did not say any thing about it publicly, until at last the recollection of these granules vanished from my memory altogether, and I only recollected the impression of the very remarkable thickened ends of the nerves, which do not occur in any other class of plants. Sprengel has directed attention to similar points in the *Crassula crenata*, but these are very different from these thickened ends of the nerves, which consist of a bundle of spiroids, as they have been represented in the Icon. Sel. An. Bot. part iii. tab. 3, fig. 8. If any parts are to be regarded as anthers, they evidently are those which Blume first of all definitely indicated, and which are represented in the same part of the Icon. Sel. tab. 3, fig. 1-5; they certainly have the greatest analogy with anthers, although I by no means attribute to them the same functions which are possessed by the anthers of the phanerogamous plants. For we need only reflect upon the eye of the mole, which certainly cannot see with it, to be convinced that nature sometimes also arranges things for no particular purpose. But provided even that these anthers of the fern, or the parts acknowledged as such by Bernhardt, really possessed the function of impregnation, I yet cannot see how hybrids can be produced in this class of plants. With regard to the anthers of Blume, they are too near the pistils of the same species; and as to those of Bernhardt, the pistils in other species are situated at so remote a locality, that it is impossible to explain how the one could get to the other.

MOSSES.

On the Structure of the Setæ of Funaria hygrometrica, by Edwin Lankester; Annals of Natural History, vol. iv. p. 362. The fruit-stalks of this well known moss have already long been known to possess hygroscopical qualities. The author instituted a more particular examination with regard to them in this respect. On taking a dry fruit-stalk into one's hand, and moistening the lower part with the finger, the capsule will turn itself from the right to the left, by making two, three, or more turns; on moistening the upper part in the same manner, the capsule turns itself still more rapidly in an opposite direction. On a microscopical examination, the whole stalk was found to consist of lengthened cellular tissue, which is twisted in a spiral form. The cellular tissue is not, however, turned uniformly, but at two-thirds of the length of the stalk it commences to assume a straighter form, and at the upper part it again turns itself, but more acutely, in the opposite direction to that of the lower part. The cause of the turning depends on this direction of the cellular tissue. It may be left to discussion, whether the moisture renders the tissue straighter in consequence of extending it, or whether it originates from the mere distension of the external tissue. The capsule turns itself in an opposite direction to the spires of the wetted end, and the circumstance of its turning more rapidly on the upper end being wetted, depends on the more acute angle made by the upper spires. But the dryness of the fibres is not the sole cause, for the green fruit-stalks, although perfectly dried, do not turn when moistened. But as the capsule turns itself towards the earth at the period of ripening, it is probable, that the turning of the fibres already existing becomes stronger; and thus the movements are produced.

By the controversy which was at one time carried on between De Saussure and De-Luc, it has been established, that dry vegetable fibre is shortened by moisture, but that the animal fibre is lengthened by it. Probably because the former is hollow, and is distended by the imbibed fluid, and thus

shortened. The second, on the other hand, may consist of closely united dense parts, which the moisture separates from each other. In the case before us, it seems that the thick fluid contents of the cells leave a precipitate in the cells of the green stalks on being dried, and thus fills them up; but this precipitate is dissolved and absorbed, and otherwise applied on the ripening of the capsule, and thus the cells, being empty, act like hollow tubes on being dried.

LICHENES.

WE find an account of H. Körber's paper, *On the Propagation of Lichens by means of Gemmules*, in the general sketch of the Works, &c., of the Silesian Society, &c., for the year 1840, p. 95. I only extract the following sentence, which appears to me to contain the principal matter of this treatise (p. 98):—
“ The individual propagation takes place through means of soredia, which form new individuals through an intercellular development. This intercellular development is prepared in the mother cell by the circumstance, that the primary gonidium, which at first is a distinct spherical cell, developing the organisable mucus contained in it into elementary globules. Further, the original mother cell is absorbed as soon as this is effected, and the soredium has issued from the thallus. The soredium is, therefore, nothing more than the contents of the mother cell, which have become free, and which develop a connected cellular tissue, from those new cells (globules) which are combined together by means of the formative mucus. These new cells, therefore, seem to be a kind of cytoblast from the original now absorbed mother cells, which, however, are still capable of transforming themselves.”

On examining *Lobaria pulmonaria*, which certainly exhibits large soredia, it will be seen, that at least with regard to them, there is not a word of truth in all that the author has stated. Such a soredium is represented in the third volume of the *Icon. Sel. Anat. Bot.* (1841), tab. 5, fig. 11. It will be seen, that the internal flocculent matter, which in *b*, fig. 13,

has been represented very much enlarged, breaks forth and forms the soredium. The external cellular integument, which is seen very much enlarged in fig. 13, on the other hand, is broken through, and nothing of it goes to the soredium. I doubt very much if the individual propagation of *Lichenes* takes place by soredia.

A L G Æ.

Remarks on Spongilla fluviatilis, by John Hogg, in Transactions of the Linnæan Society of London, vol. xviii. part iii. (1840), p. 363 and 368. The author, in his first essay, declares himself in favour of the vegetable nature of this organization. He says, that he cannot believe that the seed-like bodies of the *Spongilla* are the eggs of a *Cristatella* (*vagans*), since he has never found such a *Cristatella* in their vicinity. In the second essay he relates, circumstantially, his observations on the *Spongilla*. In the year 1838, he observed some germ-like bodies, which floated about in the vessel in which were a number of vegetating *Spongillæ*. They were small, but visible to the naked eye, of a globular, or rather of an oval shape; the lower and smaller part is opaque, the upper transparent and membranous. Their movements were as remarkable as they were elegant; they rose from the *Spongilla* at the bottom of the vessel to the surface; and either floated slowly on the surface, or roamed through the water like a balloon in the air. They approached or removed themselves from each other; calmly suspended themselves in a given spot, or turned round in circles. They always, however, moved in such a manner, that the round part was before. He placed one of these bodies in a watch-glass, and renewed the water daily twice or thrice. At first, the body moved itself, then it turned slowly round on its axis; finally, it established itself firmly, and became converted into a white opaque substance, which, as it grew in the water, appeared to be gelatinous, but when dry, exhibited small cells, and fibres, and points. About the same time, he made an experiment with the seed-like bodies which he terms sporules. He took them off from the *Spongilla*, and placed

them in a cup, which he filled with water, renewing it twice a-day. These bodies did not move, but (after they had lain for some time) a white opaque substance issued from the opening at their point, which glued the seed to the cup. This substance gradually increased, and overspread sometimes the mother body entirely, spreading itself, likewise, round about over all substances situated near it. At first, no traces of the *Spongilla* itself were seen, but only a white, thick, gelatinous matter; but, on suffering this latter to become dry, a membrane of the sponge exhibited itself, and the holes could be seen which were formed by the interlacing of the fibres, as also the small points. The author now investigated, whether the germ-like bodies had converted themselves into the seed-like, and decided against it; he thinks they are different reproductive organs, which he terms sporules and sporidia. He further enumerates observations respecting the movement of the germ-like bodies of other *Algæ*, especially of *Ectosperma clavata*, as a confirmation of the plant-like nature of the *Spongilla*. He saw the currents about the germ-like substances of the *Spongilla*, when they moved, but he did not observe cilia, as are found in real zoophytes; he even considers these cilia as characteristic of animal beings. The movement of the germ-like bodies of the *Algæ* he believes to originate in an endosmosis and exosmosis. He then enumerates other correspondences between the *Spongilla* and vegetables, as the similarity of the membrane, the gelatinous substance, the green chromule (chlorophyll), its behaviour in acids, and its development of gas in the light. He further speaks of the currents which flow from and into the cavities of the *Spongilla*, and attributes them, for the most part, to an animalcule of a green colour; not entirely, but in some measure also, to endosmose and exosmose. The author then endeavours to refute Dujardin's reasons for supposing the *Spongilla* to be of an animal nature; and lastly, adds some remarks in favour of the vegetable nature of the Sea Sponges.

The observations of the author deserve great attention. Many reasons given by him, in favour of the vegetable nature of the *Spongilla* and the Sponges in general, might certainly

not be found sufficient; but we must agree with him in the principal matter, for this reason, that these substances are deficient in a central organ, the stomach, which is peculiar to all animals. The *Spongilla* is not secreted from an animal substance, as the stems of the *Sertularia*, and similar zoophytes, which I acknowledge now to belong to the animal world, although I formerly believed they were plants. It is not, however, at all credible, that a variety of movements, such as the author observed in the germ-like bodies of the *Spongilla*, should originate from endosmose and exosmose; the membranes by which endosmose and exosmose take place remain immoveable, for the very reason, that the current of the fluids goes through them. Endosmose and exosmose can only be employed as an analogy for the explanation, and not as an explanation itself, for the simple reason, that they have not yet themselves been explained.

Several observations have been published by Laurent on the same subject, *i. e.*, on the *Spongillæ and their Propagation*, in the *Comptes Rendus* of 1840, vol. ii. p. 478, 694, 1050. M. Laurent assumes the animal nature of this organization. They exhibit, according to him, a three-fold mode of propagation:—1st, Germ-like bodies, which he considers as unciliated (non ciliés) buds: 2d, Egg-shaped bodies, which are formed in the spring, and are different from the egg-formed bodies of the later season: 3d, Protean bodies, which liberate themselves from the rhizopodal prolongations of the young *Spongillæ*. He also speaks of propagation by self-division (*scissiparité naturelle*) of the old *Spongillæ*. M. Laurent, in the second memoir, goes through the various phases of life of these *Spongillæ*. The first phase is that of latent life, in which the egg-shaped bodies and gems are first found; the contents of the former are then globular-watery (*globulino-aqueux*), and at the period of the latent life of the latter, the whole *Spongilla* is still in this state (*globulino-aqueux*). The small projections are still wanting at this time. The second phase is that of the embryonic state, when the whole tissue is almost subglobular-glutinous (*subglobulo-glutineux*); the eggs are transformed from the globular-watery state into the globular-

glutinous state; the gems also of the unciliated embryos, formerly globular, now become oblong; the projections and protean bodies appear first. The *Spongillæ* which are formed in this threefold method are the same. The *Spongillæ* in the third state appear to be first covered with a membrane, and, upon its bursting, the cavities and the eggs are seen. The propagation through protean pieces only takes place in very young individuals, which are produced from non-ciliated embryos, as the self-division (*scissiparité naturelle*) only takes place in old individuals, which have been produced from the same embryos. In the third memoir, he compares the non-ciliated free embryos of the *Spongilla*, with the free embryos of *Ectosperma clavata*. The former move about from two to three days, whilst the latter only move from two to three hours, or even immediately establish themselves. Upon applying a magnifying power of 2-300. i. d., the fibres of the embryos of the *Spongilla* were distinctly seen, but not in those of *Ectosperma*; the former also have a current around them, but the latter have not. The embryos of the *Spongilla* are white, those of the *Ectosperma* are green.

I may here refer to some observations of Agardh, in Suensk. Vetensk. Hdlgr. f. År, 1837, translated in the Flora for 1840, p. 128, where he states, that a *Draparnaldia tenuis* developed itself from moving granules; also, that he observed a movement of the granules in the articulations of the *Bryopsis arbuscula*. M. Morren's observation, that he found the *Rotifer vulgaris* in *Vaucheria clavata* (*Ectosperma cl.*), in such a position that it could not be removed on the opening of the articulation, is worth attention. Bullet. d. l'Acad. Roy. d. Bruxell., vol. vi. p. 4.

The current of fluid, observed by M. v. Lobaczewski, in the *Closterium lunula*, Nizsch, described in the Linnæa, vol. xiv. I must leave to the Zoologists, although the phenomenon is very similar to those which have been observed in *Chara* and other plants.

The observations too, which Meyen has made with regard to red snow, in Wiegmann's Archiv, 1840, vol. i. p. 166, belong to Zoology, in as much as *Protococcus nivalis* and *viridis* are

Infusoriæ, and *Euglena sanguinea* and *E. viridis*, Ehrenb., are at present doubtful beings.

F U N G I.

DRY ROT, by Schwabe, Linnæa, 1840, p. 194.—The author describes the dry rot, *Boletus destructor*, Shrad. (*Polyporus destructor*, Fries), especially the thallus, very accurately, from its first origin, and mentions, that it is more frequent in Dessau than *Merulius vastator*, Tode (*lacrymans*, Fr.) The destruction of the wood, he adds, seems to be caused by the fibres of the fungus depriving the woody cells of their contents, for the purpose of obtaining the nourishment which they require for their vegetation, by which the latter lose their consistency and toughness; the membranous walls of the cells suffer particularly, for they are always seen brittle and torn, on examining them under the microscope. In Berlin, which certainly is not far from Dessau, the *Merulius vastator*, Tode, is the most frequent. The latter, however, rather imbibes the humidity of the atmosphere by its fibres or tubes, which is distributed through the wood, and thus produces decay or decomposition.

Penicillum Bioti, described by Turpin, Comp. Rend. vol. i. p. 507. This mould had grown in a closely corked bottle, in which there was distilled water, with some dextrine, which Biot sent to the author. He describes the thallus of this fungus with great exactness, and adds, that its swollen articulations contain granules, which have induced him to classify it as a particular species. Of the fructification he says, When the vegetation has come to a certain point it decreases, the articulations of the small stems become shorter, more globular, and arrange themselves in a moniliform row, which is either simple or compound. The small globules are of a bluish colour. The fungus, according to the author, propagates itself in a threefold manner; 1st, By an almost spontaneous generation, for the organized globules of the dextrine need only to be properly arranged, in order to represent this mould at once: 2d, By globules in the tubes; and, finally, by separated joints.

I doubt if *Penicillium Bioti* be different from *Penicillium glaucum*. The latter is produced in all mucus, sweet, and vegetable acid solutions, also in solutions of salts which consist of vegetable acids.

Gardner has discovered a new phosphorescent fungus in the Brazils. Description of a New Phosphorescent Species of *Agaricus*, by George Gardner; with Remarks upon it by the Rev. M. J. Berkeley. Hooker's Journal of Botany, vol. ii. (1840), p. 406. It belongs to the tribes of pileo-eccentrica, and Berkeley states, that it might be classified in the subgenus *Panus* of Fries. The characters of it are, Pileo carnosocoriaceo, subindfundibiliformi, glabro, flavo, lamellis longe decurrentibus pallidioribus, stipite brevi, coriaceo, glabro, cinerascete. Hab. in Brasilia, ad folia Palmarum, quae ab incolis dicuntur *Pindoba*. During a dark night, at the commencement of the month of December, in the town da Natividade, in the province Goyazes, Gardner witnessed some boys knocking about a shining fungus with sticks; this induced him to get the perfect fungus, in which he succeeded, and thus was enabled to give a description of it. Berkeley adds, that there are several species of fungus which emit light in the dark, and mentions the *Ag. olearius*, Dec.; he also proposes to change the name of *Ag. phosphorescens* into *A. Gardneri*. It is a question whether these species of fungus are always shining. The *Rhizomorphae* do not shine under all circumstances.

Chrysomyxa abietis, a fungus and eruption (exanthem) of the red fir, is described by F. Unger. See Froriep's Neue Notiz. xvi. (1840), p. 10. The following is an abstract of Unger's remarks on its comparative pathology; Vienna, 1840. He first gives an exact anatomical description of the leaves of the fir, and then proceeds to the description of the exanthem. It is found on the last annual shoot, and on almost every leaf. There are yellowish discolourations on the upper side of the leaf, and similar discolourations on the under side; also one or several rust yellow spots, but only where there are rows of stomates. The yellow rust spots are elevated into a wart-like substance, and the upper membrane is torn

open ; dense tubes, of a deep red colour, are seen at the edge, and irregular tubes towards the middle, which are rather enlarged towards the upper part, and partially entwined with each other, and are seated on a mucus granular material. This substance constitutes the stroma of the pustule. A tissue of cylindrical, simple and ramified, very much matted together, fibres, is next produced. The disease terminates with the falling off of the leaves. It originates in the air holes of the leaf, in the form of a mucus granular material. The author attributes the cause to the moisture, which impedes the process of respiration. He concludes by saying, That the disease is a heterogeneous generation.

The air holes (or organs of respiration) of the author are a layer of large cells. The author confesses, that the stomates are closed up even in the youngest leaves ; but is of opinion, that the air can penetrate nevertheless. We quite agree with the author in his concluding sentence, but this is a subject of general physiology and pathology.

M. Lucas has found humin in the *Uredo segetum* ; Einhof found the same substance, but did not recognize it as humin. Braconnot separated humin from the spiroids of *Agaricus atramentarius*, Bull ; and this substance, indeed, seems to prevail in many of these lower plants. Annal. d. Pharmacie v. Wöhler and Liebig, vol. xxxvii. p. 90.

MONSTROSITIES.

M. DE LAFONT, Baron von Melicoeq, describes several modifications of the *Linaria vulgaris*, in the Annal. d. Scienc. Natur. S. II., vol. xiv. p. 255, which may be compared with the great collection of such modifications which M. Pr. Ratzeburg has published. They were collected at Cambrai and Arras, and are,—1. Corolla with two lips, two spurs, equal or unequal ; one of the flowers had six filaments, of which two were shorter than the others. 2. Corolla with two lips, three spurs, the central one longer ; of pretty frequent occurrence. 3. Corolla with two lobes, three long equal spurs ; of rare

occurrence. 4. Corolla without an upper lip, the lower lip with four divisions, four spurs of the same length, four sepals; a solitary specimen. 5. Corolla almost without an upper lip, the lower lip with five divisions, seven spurs, six filaments, two shorter, eight sepals; very rare. 6. Regular corolla; with five divisions, five spurs; rare. 7. Corolla with two lobes, but at the base with one to three, even sometimes four, flower-like appendages, coloured like the lower lip of the corolla; some of these corollas had two spurs; one specimen had a very developed corolla-like appendage, almost as long as the corolla; the two lips of the latter were lying horizontally, the spur had remained vertical. 8. Corolla perfectly reversed, and provided at the base with a genuine petal. 9. Corolla with two lobes, a flower-like appendage at the basis, three spurs of the same length, fibre filaments; rare. 10. The upper lip of the corolla with three divisions, the lower lip in four; rare. 11. Corolla with two lobes, without spurs. 12. Stem with bands. It is owing, in my opinion, to the singular position of this species, between the *Personatæ* and the *Solanaceæ*, that the flower of *Linaria vulgaris* exhibits a greater number of modifications than any other plant. It is, to make use of a simile, as if the flower was resorting to all possible means to return from its fettered state with the lips of the *Personatæ*, to the regular one of the *Solanaceæ*, with which it is really related. The modifications do not, as far as I know, extend themselves to the ovary, for it has nearly the same form in both these natural orders.

M. Göppert has published an account of some observations on *Malformations* in a specimen of *Tragopogon orientale*, in the general review of the works of the Silesian Society, f. v. L., 1840, p. 103. The pappus, in most of the flowers, was changed into small lancet-like pointed leaves, and the corolla, anthers, and stigma, were coloured a slight green. In some flowers, the filaments, as well as the anthers, were changed into small tender green leaves, and a new, perfect, small flower-head had formed itself in the axil of the stigma; the stigmata, at the same time, commencing to assume a leaf-like character. A rare proliferation certainly.

M. Naudin, in the *Ann. d. Scienc. Nat.* vol. xiv. (1840), p. 14, describes some *small plants of Drosera intermedia, produced on the leaf of another*. A leaf of *Drosera intermedia* (*Dr. anglica*), exhibited two small plants of *Drosera* in miniature on the upper side of its edge, which were developed from the cellular tissue, between the mid rib and lateral leaf-nerves at the edge, and stood at about the distance of a line and a half from each other. They were from five to six lines in length, and had, singularly enough, a stem with alternate leaves (according to the illustration); the native species of *Drosera* being stemless, and only provided with root leaves, which, in this instance, was the case with the mother plant. Nothing could be observed at the lower side of the mother leaf, excepting a black spot beneath one of the two stems, but no roots. The stems, however, issued from the naked cellular tissue, and stood in no connection with the vessels of the leaf. A very singular and remarkable monstrosity.

M. Walpers makes mention of a *Monstrous Seven-leaved Leaf of Trifolium repens*, in the *Linnæa*, vol. xiv. p. 362, and considers the three-leaved, as well as the simple leaves of the genus, as shortened pinnated ones. He adds, that the leaves of *Gleditschia triacanthos*, in which almost all the forms of leaves which occur in the *Leguminosæ* may be easily observed, together with their transformation from one into the other, are particularly instructive.

M. Hampe observed, in a bush of *Salix repens*, that twigs above the water blossomed as females, whilst those twigs, which had been in the water, and subsequently blossomed when the water was dried up, had only male blossoms. He endeavours to prove, by other instances, that *Diclinous* plants, situated in wet localities, produce more male than female blossoms. See *Linnæa*, vol. xiv. p. 367. The editors, in a supplement, add many observations respecting the change of sex in willow trees, without, however, determining the causes.

Remarks on the Ergot (clavus), by John Smith, *Linnæan Transactions*, vol. xviii. p. 3 (1840), 449. He analyzed the mucus sweet liquid of the ergot in *Elymus*, and found in it

oblong transparent bodies, similar to the sporidia of a fungus. He found the same body also in all states of the ergot, as far as the anthers of the affected ears, both in *Elymus* and in *Phalaris aquatica*; he therefore regards it as the cause of the ergot. The sporidia, according to Mr. Smith, first get into the earth, thence through the stem, as far as into the anthers, and finally through them into the ovary. He adds, also, that these sporidia have been observed by several individuals. Mr. Quekett next gives a very elaborate circumstantial treatise on this subject. The oblong bodies, sporidia, lie in ramified fibres upon the ergotised grain when it is young, but are no longer found when it is perfectly grown. The author observed the external pericarpium in torn pieces on the surface. In the interior, he found an irregular cellular tissue; he did not find the cells of the external membrane to be oblong, as phœbus, but small and quadrangular. The appendages at the point, according to the author, consist, for the greater part, of the torn pericarpium, which could not follow the growth of the grain, and thus was elevated to the point. He then gives an accurate description of the fungus, which spreads itself over the grain; he witnessed the multiplication of the sporidia, when placed in a wetted glass, either by a tube shooting forth from one side, with partitions, the joints of which separate themselves as sporidia, or by a small bud being produced at the end, which grows into a sporidium. Another kind of multiplication takes place, when the epidermis about the sporidium is torn into pieces, and sprouts out, developing granules upon itself, which become similar to those in the interior—the sporidia. The last kind of growth is the following:—A green granule extends itself laterally in the sporidia, and forms a partition, and thus divides the sporidia into two parts; each part again divides itself, and so on, so that thus a jointed simple fibre is produced, which then becomes further ramified. He also saw small green granules collected on the glass, which had separated themselves from the sporidia that were torn, as might be inferred from the presence of the torn sporidia, and which developed themselves into sporidia. As this fungus, therefore, can vegetate on glass,

remote from the grain, it would be a reason for the conjecture, that the fungus is quite different from the ergot. The author found no sporidia in the interior of the ergotised grain; the nuclei which were in it are lighter than water, whilst, on the other hand, the sporidia sink in water; the nuclei melt when exposed to heat, and then flow one into another, the sporidia do not; the former also may be dissolved by ether, not so the sporidia. The author lastly resorts to a chemical analysis, to prove that the ergot is no fungus. The author is of opinion, that the green granules of the fungus penetrate into the interior of the grasses, and develop themselves upon the ovary as upon a proper basis; they communicate the disease when they get into a sound grain, by destroying the membranous pericarpium. He terms the fungus *Ergotætia abortifaciens*, and describes its characteristics as follows:—"Sporidia elliptical, moniliform, finally separating, transparent, and containing seldom more than one, two, or three, well defined (greenish) granules." He finally adds, that a small *Acarus* (of which he also gives a rough illustration) destroys the ergot, which is important for the science of pharmacy. A brief treatise on this subject, by Francis Bauer, then follows. He rejects all external causes for the ergot, and terms it a monstrosity. He gives some excellent illustrations, in order to prove that it is the scutellum which increases in size, tears the skin of the pericarpium, and is then coloured brown. Since the fungus also occurs on other parts of the grass besides the ovary, he is induced to think, that the latter does not produce the ergot, but that it only occurs incidentally.

The now deceased excellent artist was certainly right. Quekett's researches and reasons afford more proof *against* the origin of the ergot, from a fungus, than in favour of it. And, supposing even that the fungus only did occur in the ergotised grain, and did not grow at all without it, this would yet be no sufficient reason for the assertion that it was the cause of the ergot. Is *Tubercularia vulgaris* the cause of the dryness of wood, because it is not found upon any thing else than dry wood, or only the consequence? I laid

drawings of the ergot before the assembly of Naturalists, at Florence (1841), in which the grains at the point had sprouted out into three leaves; an additional reason in favour of the ergot being only a monstrosity. It still remains to be ascertained, whether the excrescence only occurs on the scutellum. The fungus which Quekett has very well described, is an *Oidium*. It is well that we can get rid of such an abominable term as *Ergotætia*, badly formed as it is from the Greek and the French. The observations on the different modes of propagation are very interesting; it is a question, however, whether they are not the result of an optical illusion.

SECRETION.

Observations on the Phenomena of Water Drops on the Leaves of some Plants, by Rainer Graf, Flora, 1840, p. 433. The author principally instituted his observations on the *Impatiens nolitangere*. These drops may be observed in the cotyledons, and that always at the small teeth, in which the nerves of the leaf terminate, which run through the centre of the leaf. Small drops even make their appearance in the primordial leaves, whilst they are still folded together in the bud, they occur at the edge in all places, which subsequently become crenated. As soon as the leaves of the plant have attained their full development, the drops appear on the crenatures, which have been formed by the tendril, and by the secondary nerves in the leaves. The still undeveloped leaves of all succeeding buds, are also covered with drops in the same way as the primordial leaves. A small drop appeared regularly at the point of each of the calyx leaves, until the capsule began to swell, also on the point of the bractææ, and, finally, also on the flowers. They appear here at the middle tooth of the upper arched petal, and at the point of the lower valve-like calcareate petal. The drops are largest on the cotyledons, those on the leaves follow next; and there they are always larger at the points of the tendrils than at the points of the secondary nerves. The drops, which in other

respects consist of perfectly tasteless and scentless water, usually appear within ten or twenty minutes after rain or watering the plant. If the plants had become withered before watering, the upper leaves first erect themselves, the branches follow next, and thus it goes on to the lower leaves. The capsules also, when quite at rest, are in the habit of opening as soon as the drops appear after the water. The drops likewise disappear again, and that in a very different manner. Sometimes they are suspended without any change for the whole of the day, at other times they disappear again in half an hour. The author could not attribute this to mere evaporation, and made the following experiments:—He managed to attach a drop of common water, of about the size of the drops in question, by means of a fine needle, to the edge of the leaf, at a place where there was no aperture to the nerves. This drop was to be perceived for a considerable time after, the other drops which had made their appearance at the apertures of the nerves, had all disappeared. The author, in order to proceed with still greater security, took off a drop, that had made its appearance, with great caution from the crenature, and attached it to another part of the leaf; this also was to be seen unchanged after a long time, whilst the other drops attached to the crenatures had disappeared. The appearance of the drops, therefore, on the plants, the author adds, cannot always be considered as a secretion of the superfluous nourishing sap; but it seems, on the contrary, that the sap rises so rapidly, and in such great quantity, that the same cannot be immediately and properly distributed, and consequently issues at all apertures. As soon, however, as the distribution of it has taken place in the cellular tissue, the part temporarily secreted, in the shape of drops, is also imbibed, and applied to further distribution in, and nourishment of the plant. The author instituted similar experiments with the leaves of the cauliflower, and the result was the same; he also observed the same occurrence sometimes when the drops had accidentally got displaced. Although the drops of the cauliflower are larger than those of the *Impatiens nolitangere*, they yet disappear more rapidly, very

probably owing to the greater circumference of the leaves, in which the distribution takes place more rapidly than in the smaller leaves.

This familiar phenomenon has found, in this instance, an excellent observer. That the vessels, the spiroids, namely, which are situated in the leaf-nerves, carry the juice of nutrition rapidly from one place to another, conducting it finally to those points where it is necessary for the nourishment of the plant, is convincingly demonstrated in these observations.

Remarks on the Formation of Crystals in the Vegetable World, have been published by Unger in the Ann. of the Vienna Museum of Natural History, vol. ii. p. 1. After having treated generally of their occurrence, he gives drawings of crystals in the cellular tissue of many plants, which, however, are not sufficient for their determination, as the sizes of the angles are not stated. This is followed by some chemical researches. He dissolved crystals of *Piper blandum*, *Ficus bengalensis*, and *Maranta zehrina*, in nitric acid, and neutralised the liquid with ammonia. The precipitate was heated in a platina crucible; that of the crystals from *Piper blandum* was alone coloured brown. After having been heated, effervescence of all of them took place, on being treated with acids. The crystals consisted, in all three cases, of a vegetable acid, and most probably of lime; the acid in the crystals of *Maranta zehrina* and *Ficus bengalensis* were oxalic acid; the acid, however, in the crystals of *Piper blandum* must have been a different one.

Payen has instituted some researches on the *Calcareous Precipitates, and Precipitates in General in Plants*. (Compt. Rend., 1840, vol. ii. p. 401). The stalked, club-shaped substances in the species of *Ficus*, which are covered with calcareous precipitates, and which Meyen first observed, have been investigated by the author in *Ficus ferruginea*, *laurifolia*, *bengalensis*, *nymphæifolia*, *elastica*, *Carica*, *religiosa*, and *reclinata*; further in *Parietaria officinalis*, where they are very large; in *P. lusitanica* and *arborea*, *Urtica nivea*, and *Forskalea tenacissima*. The cylindrical concretions from *Celtis australis*, and the pear-shaped ones from *C. missisipensis* were similar;

likewise the concretions in the leaves of *Morus nigra*, *alba*, and *multicaulis* ; those of *Broussonetia papyrifera*, *Humulus Lupulus*, and *Cannabis sativa*, are situated at the basis of the hair. These substances are generally found on the upper surface of the leaf, beneath the epidermis, at times on the lower surface, as, for instance, in the ordinary fig tree, more rarely on both sides at the edge, as in hemp. A large leaf of *Broussonetia papyrifera*, contained 134,000 concretions. Carbonate of lime is frequently met with between the cells of the parenchyma of the leaves and their nerves, in the channels of the petioles of the leaves, and of the stems ; it is also found under two forms in the leaves, one containing a juice so acid, that it would dissolve the carbonate of lime. The author is of opinion, that the deposit here takes place through the carbonate of ammonia of the atmosphere. The oxalate of lime forms glands in the leaves and the stems of *Cactus*. Raphides consist of a membrane, which is filled with oxalate of lime ; they develop themselves in cells, which consist of a special tissue, and contain a nitrogenous substance. Silica covers the membranes of the leaves of many plants, perhaps of all ; and is found also in the cells of the stems of the *Gramineæ*, *Characeæ*, and *Equisetaceæ* ; also in the intercellular spaces, and likewise in the form of a spheroidal concretion, which is secreted by a tissue that develops itself in a cell. *Chara translucens* is incrustated with silica ; *Chara vulgaris*, in the same water, is found covered with carbonate of lime and silica, whilst *Chara hispida* has only carbonate of lime.

SPERMATIZOA IN PLANTS.

ON the *Anthems of Chara*, and on the *Animalcules in the same*, by Gustav Thuret, *Annal. d. Sc. Naturell.* vol. xiv. p. 65. The so-called anthers of *Chara*, consist in their interior of a convolution of fibres, with partitions, in which the spermatozoa are situated. These fibres, in the young state, are only oval sacs, they then get partitions, and afterwards, frequently very rapidly, a nucleus is produced, which assumes

a brown colour on the application of tincture of iodine. The animalcules appear subsequently to the nucleus, and remnants of the nucleus may sometimes be seen on one side of the cell, and on the other side an animalcule. These animalcules are at first immovable; they soon, however, make efforts to liberate themselves from their prison. They move themselves more rapidly in the warm than in cold weather, and in such a manner, that their animal nature cannot be doubted. The most distinct part of the body is a spirally formed twisted fibre, with three to five twinings. Two bristles or feelers (tentacles) appear just behind one of the ends of the spines; they possess extraordinary sensibility, and with them the animalcule moves continually with great rapidity. They are, therefore, not seen as long as the animalcule is alive, but only when its movements become slower, or cease altogether. They are seen best when some tincture of iodine is put into the water, when their movements cease, and they become more visible by the brown colouring. This is particularly the case, if the water with the tincture is allowed to evaporate from the vessel which contains the object. The author also observed a current of fluid in the sacs which surround the fibres.

Meyen has published an accurate description of the anthers of the *Characeæ*, and of these animalcules, in the third volume of his Physiology. He did not see the two feelers. I was, he says, p. 223, at first only able to recognise the existence of the long thin end, through the few thicker little points. Two, and even three, small points of the kind are frequently seen, which change their position with great rapidity. He adds, "For some time I was of opinion, that the fine end of these spermatozoa was ramified, and that the little points were to be considered as the thickened end of these branches; but in the spermatozoa, which seemed to die slowly, from their movements gradually becoming more slow, I was at last able distinctly to observe, that the fibrous end in the spermatozoa is as little ramified as in those of the lower plants." Who, then, is in the right?

GROWTH—NUTRITION.

CHEMICAL researches can only be taken into consideration here, in as far as they have reference to the plant as an individual. They belong to a division of chemistry, called organic, which only contemplates substances produced by a vital process.

An important work has lately been published, in relation to the nutrition of plants: *Organic Chemistry, in its Application to Agriculture and Physiology*, by Justus Liebig. Brunswick, 1840. The contents of this work are well known to all who are occupied with subjects of this kind, and it will not be necessary to give extracts from it. I shall, therefore, only take the liberty of making a few remarks. It proves, in a very convincing manner, that the substances which are taken up from the humus, by water, are not sufficient to yield the carbon which is found in plants. It would, on the other hand, have been desirable, if it had been proved equally satisfactorily, that the atmospheric air, which surrounds the plants, both in the quantity of carbonic acid contained in it, and decomposed by the plant, was sufficient to afford the plant the carbon which it requires for its sustenance. The author's remarks on this point are very arbitrary. He calculates the weight of the whole atmosphere, the thousandth part of the weight of which, according to the experiments of Saussure, is carbonic acid; and thus gives a number of pounds for the carbonic acid contents, which far exceeds the quantity of carbon in plants. He further assumes, that the surface of the leaves of plants, is twice as great as that of the surface of the soil upon which they grow; and that in each second of time, during eight hours daily, 1-1000th part of its weight of carbonic acid is extracted from the atmosphere; so that the leaves, in 200 days, take up 1000 pounds of carbon. The last assertion is entirely hypothetical. The first calculation is founded upon the circumstance, that carbonic acid is equally diffused through the whole atmosphere; a fact, however, which is by no means perfectly established. Experiments in Ward's apparatus

would be far more convincing. The author further treats of imbibition of oxygen by plants, first observed by Saussure, and says, This process has no share whatever in the life of the plant. Oxygen is, however, consumed in plants. The scentless and tasteless leaves of *Agave americana*, take up little; those of *Pinus abies*, containing oil, more; those of *Quercus robur*, containing tannic acid, still more; among all of them, the balsamic (??) leaves of *Populus alba* most. The author adds, that beyond a doubt, and most manifestly, this chemical action exhibits itself in the leaves of the *Cotyledon calycina*, and of the *Cacalia ficoides*, and others. In the morning they are acid like sorrel (there is proof of this wanted); towards noon they are tasteless; in the evening bitter (not to be perceived). A genuine process of oxydation, he says, also takes place at night; the acid formed, enters into substances which contain hydrogen and oxygen, in the same proportion as in water, or that contain less oxygen, as in all tasteless and bitter matters. But, on causing *Cotyledon calycina* to remain the whole day in the dark, the reaction of the juice is always acid; and the most simple inference is, that the oxygen, which, when taken up, constitutes the acidity, is again secreted when exposed to the light. The author likewise asserts, that the exhalation of carbonic acid which has been observed, has nothing to do with the process of assimilation. The water of the soil contains carbonic acid gas, which is taken up by the roots and by the leaves, with the water, and is again exhaled. But why is this carbonic acid not decomposed, and would it not be a much better source of sustenance than the atmosphere itself? Is the whole of the carbonic acid of the atmosphere really decomposed?

I by no means wish to dispute the principal fact, but would suggest, that the dictatorial manner assumed by the author, must render his conclusions suspicious. The author is quite angry, that the talent and ability of Botanists should have been wasted in the investigation of the structure and the external forms of plants, whilst chemistry and physiology have been neglected, in the explanation of the most simple processes. As a proof, he quotes Reum's Forest Botany, and a sentence from Burdach's Physiology. Why these, above all? It certainly

is unjust to attribute to all the neglect of two. Chemistry has certainly been taken into consideration in the better systems of physiology ; but Botanists cannot be blamed, if they do not at once take every thing for granted that is told them by chemists. The author further says, in his indignation,—As soon as the mysterious vital power is presented to the physiologists in some phenomenon, they renounce their senses and judgment, &c., &c. Strange ! Finally, the author demands, that the bugbear, “vital power,” as he expresses it, be assumed, to place substances together in such a manner, as to constitute a spiral vessel, a cell, a leaf, a blossom. The author then proceeds to the assimilation of hydrogen in plants. He says, the solid part of the plant, the woody fibre, contains carbon and the constituents of water, or the elements of carbonic acid. We can suppose the wood to be produced from the carbon of the carbonic acid, which is combined with the elements of the existing water, under the influence of the light of the sun ; in this case, oxygen is given off as gas, and the carbon is assimilated in the plant ; or, what is more probable, the plant, under the same circumstances, containing carbonic acid, decomposes the water ; its hydrogen is assimilated with the carbonic acid, in order to form the woody fibre, whilst its oxygen is given off. The woody fibre contains carbon and the constituents of water ; there is, however, more hydrogen in the wood than corresponds with this relation ; hydrogen is situated within the wood, in the form of chromule, wax, oil, resin, &c., &c. It cannot be doubted, that hydrogen is assimilated by the plant from the water ; but it has not yet been explained how this is done ; the author only states conjectures, and does not enter into the reasons of the chemical combinations and decompositions. The assimilation of nitrogen, according to the author, takes place from the carbonate of ammonia in the atmosphere, which is carried down by the rain, and imbibed by the roots of the plant. Rain water, according to the author, contains carbonate of ammonia. This salt gets into the atmosphere through the medium of decaying animal and vegetable substances. This seems to be very correct. Gypsum, the author adds, is used as manure, because it decomposes carbonate of ammonia, and

fixes it, as sulphate of ammonia; it does not act as a stimulant; a plant has no nerves, therefore there can be no substances by which a leaf can be stimulated to appropriate to itself a greater quantity of carbon from the air, when the other constituents are wanting which the plant requires for its development. The explanation of the mode of action of gypsum is improbable, and the author must show, first, that sulphate of ammonia has been formed in gypsum, when long exposed to the atmosphere, and why plants should not be capable of stimulation. A considerable part of the work of the author is devoted to the inorganic constituents of plants. He shows their constancy, and also, that one constituent supplies the place of another in its various combinations; thus, for instance, it has been proved, by the analyses of the fir of different localities, that the number of bases is certainly different, but that the quantity of oxygen in them is the same. Indeed, it is very probable, judging from what the author states, that alkaline bases are essentially necessary for the development of plants. These constituents of the soil, in general, have the greatest influence upon the growth of plants, a circumstance which is elaborately investigated in the sections on the culture of plants, on the rotation of crops, and on manures. This first part appears to me the most important in the work, as belonging to our subject; the second part is purely chemical.

In the *Journal of Practical Chemistry*, by Erdmann and Marchand, vol. xx. p. 267, we find a continuation of confirmatory experiments, *on the effect of humic acid bases particularly of those prepared from peat as a means of manure*, by W. A. Lampadius. The composition consisted of the refuse of peat, of chalk-dust, of brick-dust, and ashes, in the proportions 53, 3, 3, 3. A development of carbonic acid is probably also effected here, through the action of humic acid on the chalk-dust.

Speculations on the *sources of Carbon and Nitrogen in Plants and Animals*, are found in Daubeny's *Lectures on Agriculture*, and an extract from them appears in the *Edinburgh New Philosophical Journal*, vol. xxx. p. 360. Daubeny directs attention to the fact, that carbonic acid and ammonia,

which, as he had proved to be the sources of the carbon and of the nitrogen in plants, were contained in so varying proportions in the atmosphere, that they would appear to be opposed to combination; and also, that they were known to issue from the interior of the earth at different places. The author adopts Liebig's theories; his argument is generally physicotheological, and he cites the fact, that ammonia would be injurious to plants if given alone in a requisite quantity. This might be easily answered. But the presence of carbonic acid in all spring water, would certainly seem to favour the conjecture of a subterraneous origin; and the phenomenon of ammonia in rain water, might likewise originate from a general telluric cause, even if we do not exactly take into consideration volcanic agency. But this subject, properly speaking, belongs to geology.

MISCELLANEOUS.

Etudes sur l'Anatomie et la Physiologie des Végétaux par Th. Lestiboudois, *Annal. de Scienc. Nat.*, vol. xiv. p. 267. The editors of the *Annales* state, that this paper constitutes a part of a *Memoir d. l. Soc. Roy. d. Scienc. de l'Agricult., et d. Arts de Lille*, pro 1839, the great extent of which, however, renders it impossible to communicate every thing of novelty and importance in it; and many illustrations would likewise be necessary for that purpose; and they have, therefore, contented themselves, by giving the "resumé général" at the end. The author commences with the elementary constituents of plants. The first elements of the organs, are the small globules, which are found in the elaborated sap, and which seem to possess a peculiar life. When more developed, they constitute globuline, starch, &c. They form lamellæ by their union, which together form the lamellary tissue (*tissu lamellaire*) that constitutes the basis of the plant. This tissue exhibits itself under a double form. The cellular tissue (*t. utriculaire*), and the vascular tissue (*t. vasculaire*). The cellular tissue consists of vesicles, or small sacs, which adhere to

each other. These sacs are hexagonal, round, or oblong, flattened or spiral formed (*Cucurbita pepo.*), ramified (*Ficus elastica*), &c., &c. They either have simple walls, or are covered, internally, with free spiral formed twisted fibres (lames), or the fibres are combined (soudées), and form slits (utr. scalariformes), or they form large and narrow holes, which are regularly or irregularly distributed (utr. poresuses). Further, they are, when developed, empty, as in the pith (aréolaires), or full of juice (succulentes), or they contain a coloured juice, which thickens, and renders the walls thicker (utr. parenchymateuses). The vessels are of a twofold kind ;—1st, Proper vessels or bark-vessels, which carry a more or less coloured juice : 2d, Tracheæ, central, or wood-vessels. The tracheæ have a fibre in the interior, which lies close to their walls ; this fibre is free, twisted in a spiral form, and may be unrolled in the true tracheæ, or it is double, either with edges that are remote from, or touch each other ; or the edges are here and there entwined with the false tracheæ, or with the cranny like vessels (v. fendus) ; or they are intergrown with each other, in a manifold manner, as in the porous vessels. The tracheæ sometimes consist of small pieces, which are joined to each other at their ends (v. articulés). These different forms are frequently found together in one and the same vessel, but one form never changes itself into another.

Dicotyledons.—The stems of *Dicotyledons*, at the commencement of their formation, are formed of a transparent, juicy, imperfectly developed organized cellular tissue. They soon exhibit more juicy and coloured points, which in definite numbers constitute the parenchymatous bundles. These bundles contain vessels of a twofold kind ;—1st, Proper vessels, which are placed towards the circumference, and especially towards the external circumference : 2d, Tracheæ, which are situated in the interior of the bundles. The parenchymatous bundles are situated in the pith of the stem, and are divided into three parts, the central pith, the medullary rays, and the bark. The first period of growth follows. A transparent intervening space exhibits itself between the two vascular groups of the parenchymatous bundles, which is only an

exhaled cambium (exhalé), with an imperfect organization. This gelatinous zone soon organizes itself, and becomes parenchyma, in which new tracheæ are situated on the external, and new proper vessels on the internal side of the older vessels; and between them a new gelatinous intervening space is formed. An analogous growth also takes place in the medullary rays. Some vessels remain stationary at the first period of their growth, their vascular bundles are always round; the gelatinous intervening space of the bundles becomes solid, and thus also the analogous intervening space in the pith forms rays. In the second period the parenchymatous bundles are lengthened through the external part of their central portion, and through the internal part of their bark portion; these growing portions also spread laterally. By this the central portion of the bundle becomes triangular, and strives to effect a combination with the adjacent bundle. The cellular intervening spaces of the bundles, which are situated between the vascular masses, correspond with the intervening spaces of the other bundles, and in this way the medullary layers (circonférences médullaires) are formed, which, however, do not always fit exactly one upon another. The new vascular groups do not, however, attach themselves immediately to the old, but there is almost always a separating cellular tissue between them. This is very easily to be distinguished in the roots of the beet. The bundles meet at the end of the first year, and thus is produced the first annual ring. New transparent layers are produced between the wood and bark in the third and fourth period of the growth, from an exhaled cambium; new vascular fibres are produced in the parts which belong to the central system, and are separated by medullary layers and medullary rays, which are either continuations of the preceding year, or new formed ones. At last, the internal layers of wood, and the external layers of bark, become dense and hard. The root of the *Dicotyledons* is similarly formed to the stem; and although the pith does not appear in many roots, it yet penetrates into it, gradually decreasing. Of the leaves the author says, that the position of the leaves on the stem have hitherto alone been investigated, without seeking

for their derivation in the position of the bundles of the stem ; he carries this out by contemplating the opposite, whirled and alternate, leaves. The buds he distinguishes into terminal buds and lateral buds ; the former are only the end of the stem, which is connected with the transparent growing zone,* and consequently can go on developing ; the latter are formed by a prolongation of a part of the parenchyma of a median bundle, which is carried away by the pressing forward of the leaf-fibre. The blossoms he contemplates in the same manner as the leaves, and says, that the symmetry of the alternate leaves is most frequently that of the parts of the flower, and that five parts present themselves in the blossom, as five leaves most frequently do in a single turn of a stem. *Monocotyledons*.—The author lays particular stress upon the doctrine, that there is no difference between the stem of the *Monocotyledons* and annual plants, the growth of which is limited, in as far as the bundles are rounded, and remain isolated ; as the transparent part also does not develop itself, but becomes more dense, or disappears, so that no separation takes place between the central and bark portions. The growth takes place in the following manner :—The new fibres are produced from the external fibres, and also from those which constitute the denser part of the stem ; and further, from those which are situated near the pith. The result of the growth, therefore, does not occupy any particular zone ; it takes place through the whole thickness of the trunk, and is therefore no larger on the outside than on the inside.

The researches of the author deserve every attention, and many points have been illustrated in an admirable manner. That the granules, which are situated in the sap, should form cells by their union, is a mere hypothesis, which lacks all probability. What the author says of the vessels is very correct in general ; but it is strange, that he mistakes the liber and the prosenchyma for proper vessels. For it is evident, from his description of the woody bundles, that he means that tissue when he speaks of proper vessels. The latter are distinguished by their great diameter ; and although they contain no coloured juice, there are yet granules in the juice, which

render them very distinct. Nothing of the kind is seen in the liber tissue, and still less in the cells of prosenchyma. The proper vessels are likewise of much rarer occurrence in plants than the two tissues alluded to. The cellular tissue is perfectly organized, even in the earliest state ; and it is always owing to the want of a good microscope, if it does not appear organized in the phanerogamia. He has correctly explained how the central part develops itself in the woody bundles, which he calls, against all the usages of language, " faisceaux parenchymateux ;" but every thing is not accomplished by this alone. If the author asserts, that the root is not different from the stem, he must have overlooked the circumstance, that the pith is wanting in most roots, or, when it does exist, that it wedges itself towards the apex ; and that, on the contrary, the pith increases towards the apex of the trunk. The reference to the fibres of the stem, for the representation of the position of the leaves, does not appear to me of importance ; and his idea of the formation of the bud seems quite erroneous. With respect to the *Monocotyledons*, the author overlooks the circumstance, that there is not a series of woody bundles existing in them, as in the *Dicotyledons*, and that evidently some of them are produced at a later period, which alters the matter altogether.

INDEX.

To the FAMILIES, GENERA, and SPECIES, of which mention, other than the Name only, is made.

MAMMALIA.		MAMMALIA.	
	Page		Page
<i>Ægoceros Pallasii</i>	108	<i>Cavia aperca</i>	101
<i>Alactaga indica</i>	90	<i>rufescens</i>	101
<i>Amphisorex Lesueurii</i>	74	<i>Cælogenys fulvus</i>	101
<i>Anomalurus Fraseri</i>	90	<i>Centurio</i>	71
<i>Antilope bohor</i>	107	<i>Cercolabes melanurus</i>	100
<i>gorgon</i>	107	<i>Cercopithecus</i>	64
<i>sagia</i>	107	<i>Burnettii</i>	65
<i>Arctomys flaviventer</i>	90	<i>labiatus</i>	64
<i>monax</i>	90	<i>Lalandii</i>	65
<i>Argali</i>	108	<i>leucampyx</i>	65
<i>Arvicola americana</i>	97	<i>monoides</i>	64
<i>fulvus</i>	97	<i>pygerythrus</i>	65
<i>nasutus</i>	97	<i>roloway</i>	65
<i>neglecta</i>	7	<i>ruber</i>	65
<i>Roylei</i>	97	<i>rufo-iridia</i>	65
<i>scalopoides</i>	97	<i>Cerodon saxatilis</i>	101
<i>Townsendii</i>	97	<i>Cervus artisiensis</i>	106
<i>Ascomys borealis</i>	93	<i>bresciensis</i>	106
<i>Asinus equuleus</i>	105	<i>Chæropus</i>	83
<i>hamar</i>	105	<i>castonotis</i>	83
<i>Atherura africana</i>	100	<i>ecaudatus</i>	83
<i>Banteng</i>	110	<i>Cheirogaleus Commersonii</i>	68
<i>Bos atlanticus</i>	111	<i>Smithii</i>	68
<i>gaurus</i>	110	<i>Chimpansee</i>	61
<i>Brachysorex</i>	74	<i>Colobus guereza</i>	64
<i>Harlani</i>	75	<i>ursinus</i>	64
<i>Bradypus gularis</i>	103	<i>Corsira nigrescens</i>	75
<i>infuscatus</i>	103	<i>Crossopus himalayicus</i>	75
<i>Canis Azaræ</i>	81	<i>platycephalus</i>	75
<i>primævus</i>	81	<i>Cynogale venatica</i>	79
<i>rutilans</i>	81	<i>Dasyprocta aguti</i>	101
<i>Capaccinius megapodius</i>	23	<i>albida</i>	101
<i>Capra</i>	107	<i>Azaræ</i>	100
<i>simaitica</i>	109	<i>caudata</i>	101
<i>Carigüeya</i>	83	<i>nigra</i>	100
		<i>nigricans</i>	100

MAMMALIA.		MAMMALIA.	
	Page		Page
<i>Dasypus uroceras</i>	104	<i>Hypudæus fulvus</i>	97
<i>Delphinus abusalem</i>	111	<i>neglectus</i>	97
<i>globiceps</i>	111	<i>nivalis</i>	97
<i>Dichobune cervinum</i>	105	<i>Innuus speciosus</i>	66
<i>Didelphys</i>	83	<i>Kerivoula</i>	71
<i>albiventris</i>	83	<i>Lagomys nepalensis</i>	103
<i>aurita</i>	83	<i>rufescens</i>	102
<i>incana</i>	84	<i>Lemur coronatus</i>	68
<i>tricolor</i>	84	<i>Leopardus</i>	81
<i>Dila Khaufuk</i>	55	<i>Lepus americanus</i>	102
<i>Dingo</i>	80	<i>aquilonius</i>	101
<i>Dipus mauritanicus</i>	91	<i>artemisias</i>	102
<i>vexillaris</i>	91	<i>Bachmani</i>	102
<i>Echimys</i>	92	<i>hibernicus</i>	101
<i>Elasmotherium</i>	105	<i>melenurus</i>	102
<i>Equus hippagrus</i>	105	<i>Richardsonii</i>	102
<i>varius</i>	104	<i>timidus</i>	10
<i>Erinaceus ægypticus</i>	73	<i>Townsendii</i>	102
<i>albiventris</i>	72	<i>Loncheres</i>	92
<i>æthiopicus</i>	73	<i>Lonchoceros elegans</i>	92
<i>algeras</i>	73	<i>laticeps</i>	92
<i>heterodactylus</i>	72	<i>Lonchophorus</i>	92
<i>platyotis</i>	73	<i>Lutra solitaria</i>	78
<i>Eriodes frontatus</i>	66	<i>Macroscelides Rozeti</i>	76
<i>Felis pardaloides</i>	81	<i>Malacothrix</i>	95
<i>Galago crassicaudatus</i>	55	<i>Markhor</i>	109
<i>minor</i>	68	<i>Marsupialia</i>	82
<i>Gaur</i>	110	<i>Mastomys Popelarii</i>	98
<i>Gayal</i>	110	<i>Megatherium</i>	103
<i>Genetta Richardsonii</i>	79	<i>Meles Morreni</i>	79
<i>Genetts</i>	79	<i>Mias kassar</i>	62
<i>Gerbillus erythrurus</i>	96	<i>pappan</i>	62
<i>Glyptodon clavipes</i>	103	<i>Rambi</i>	62
<i>Guillinomys chilensis</i>	98	<i>Miopithecus</i>	66
<i>Harpiocephalus</i>	71	<i>capillatus</i>	66
<i>Herpestes Widdringtonii</i>	80	<i>Missurium Kochii</i>	105
<i>Hesperomys</i>	96	<i>Monotremata</i>	104
<i>Heterocephalus</i>	93	<i>Muridæ</i>	94
<i>glaber</i>	93	<i>Murinæ</i>	71
<i>Hippotigris antiquorum</i>	105	<i>Mus alexandrinus</i>	95
<i>isabellinus</i>	105	<i>aureofus</i>	95
<i>Holophorus</i>	104	<i>betulinus</i>	98
<i>Hyæna brunnea</i>	81	<i>cæruleus</i>	95
<i>Hylobates concolor</i>	63	<i>carolinensis</i>	96
<i>entelloides</i>	63	<i>hibernicus</i>	95
<i>leucogenys</i>	63	<i>humilis</i>	95
<i>Hypodop</i>	111	<i>Leontii</i>	96
<i>Hypudæus agrestis</i>	97	<i>michiganensis</i>	96
<i>alpina</i>	97	<i>minutus</i>	95

MAMMALIA.

	Page
<i>Mus polionotus</i>	96
<i>varijs</i>	96
<i>Mustela fusca</i>	78
<i>Myodus hudsonicus</i>	98
<i>Myopotamus</i>	98
<i>Myosorex</i>	75
<i>Myotis</i>	71
<i>Myoxus cineraceus</i>	90
<i>Nelomys</i>	92
<i>antricola</i>	92
<i>sulcidens</i>	92
<i>Nesokia</i>	94
<i>Nodulinia</i>	71
<i>Nyctipithecus Azaræ</i>	67
<i>trivirgatus</i>	67
<i>vociferans</i>	67
<i>Orycterotherium missouriense</i>	104
<i>Osmetectis</i>	80
<i>Osphranter</i>	84
<i>Ovis</i>	107
<i>Ox</i>	109
<i>Pachypus</i>	104
<i>Paradoxurus Nubiæ</i>	80
<i>Phascogale epicalis</i>	84
<i>leucopis</i>	84
<i>Phlæomys Cuningii</i>	96
<i>Phyllomys</i>	92
<i>Phyllophora megalotis</i>	69
<i>Phyllostoma elongatum</i>	69
<i>excisum</i>	69
<i>Platyonyx</i>	60, 103
<i>Plecotus brevimanus</i>	22
<i>Pithecia pogonias</i>	66
<i>Pithecus bicolor</i>	63
<i>Pleurodon</i>	104
<i>Presbytis nobilis</i>	63
<i>Procyon psora</i>	77
<i>Pteromys derbianus</i>	88
<i>volans</i>	89
<i>Pteropus dasymallus</i>	68
<i>psclaphon</i>	68
<i>schoensis</i>	68
<i>Rhinoceros megarhinus</i>	106
<i>Rhinolophus ferrum equinum</i>	69
<i>fumigatus</i>	69
<i>morio</i>	69
<i>Rhinopoma carolinense</i>	72
<i>Rhizomys macrocephalus</i>	93
<i>Rhizomys minor</i>	93

MAMMALIA.

	Page
<i>Rhombomys robustus</i>	96
<i>Rodentia</i>	84
<i>Scalops argentatus</i>	77
<i>Breweri</i>	77
<i>latimanus</i>	77
<i>Townsendii</i>	77
<i>Schizodon</i>	91
<i>fuscus</i>	91
<i>Sciuropterus caniceps</i>	88
<i>nobilis</i>	88
<i>oregonensis</i>	88
<i>Sciuridæ</i>	85
<i>Sciurus Adolphei</i>	87
<i>atrodorsalis</i>	86
<i>Belcheri</i>	88
<i>caniceps</i>	86
<i>castaneoventris</i>	86
<i>Delessertii</i>	86
<i>ferrugineiventris</i>	87
<i>gilvicularis</i>	88
<i>italicus</i>	11
<i>lanigerus</i>	87
<i>leucogenys</i>	87
<i>mollipilosus</i>	87
<i>mustelinus</i>	87
<i>occidentalis</i>	87
<i>Piladei</i>	87
<i>Richardsonii</i>	87
<i>rufo-brachium</i>	87
<i>rufo-gaster</i>	86
<i>rufo-gularis</i>	86
<i>rufo-niger</i>	86
<i>splendidus</i>	88
<i>Stangeri</i>	86
<i>Scotophilus</i>	71
<i>Seal</i>	81
<i>Semnopithecus dussumieri</i>	63
<i>Sinua morio</i>	62
<i>Wurmbii</i>	62
<i>Smilodon</i>	60
<i>Sorex</i>	74
<i>crassicaudus</i>	74
<i>etruscus</i>	15
<i>giganteus</i>	74
<i>Gmeleni</i>	75
<i>herpestes</i>	74
<i>indicus</i>	75
<i>Perrotetii</i>	74
<i>pulchellus</i>	76
<i>Sonneratii</i>	74
<i>suaveolens</i>	75
<i>Sorex varius</i>	75

MAMMALIA.		AVES.	
	Page		Page
<i>Spermophilus annulatus</i>	89	<i>Alauda alpestris</i>	121
<i>citillus</i>	90	<i>Alcedo smyrnensis</i>	125
<i>guttatus</i>	90	<i>Aleuthethia</i>	130
<i>musicus</i>	90	<i>Anas</i>	133
<i>Townsendii</i>	89	<i>discors</i>	133
<i>Stemmatopus cristatus</i>	81	<i>purpureoviridis</i>	133
<i>Sturnira</i>	69	<i>Anthus pratensis</i>	124
<i>spectrum</i>	69	<i>Ardea minuta</i>	131
<i>Sus americanus</i>	106	<i>Athene Woodfordi</i>	118
<i>Talpa wogura</i>	76	<i>Bubo capensis</i>	118
<i>Tamias Hindei</i>	89	<i>Bucco malaccensis</i>	126
<i>minimus</i>	89	<i>Bucconidae</i>	126
<i>striatus</i>	89	<i>Budytes</i>	123
<i>Townsendii</i>	89	<i>Callyrhyncus</i>	121
<i>Tarsipes</i>	82	<i>Caprinulginae</i>	125
<i>rostratus</i>	82	<i>Carnifex</i>	118
<i>Spenceræ</i>	83	<i>Catamblyrhyncus</i>	121
<i>Trilaticus</i>	71	<i>Certhiaceæ</i>	124
<i>Trochictis carbonaria</i>	79	<i>Certhiparus</i>	124
<i>Urotrichus</i>	76	<i>Chizorhis leucogaster</i>	128
<i>talpoides</i>	76	<i>personata</i>	128
<i>Vandeluria</i>	94	<i>Chlamydera</i>	5
<i>Vespertilio</i>	71	<i>Coccyzus americanus</i>	126
<i>brachyotis</i>	22, 70	<i>erythropygus</i>	126
<i>californicus</i>	71	<i>Conostoma</i>	119
<i>carolinensis</i>	72	<i>Corvus infumatus</i>	119
<i>emarginatus</i>	22, 70	<i>Cuculinae</i>	126
<i>humeralis</i>	23	<i>Cuculus serratus</i>	126
<i>irrotatus</i>	70	<i>Cypselus leucocotus</i>	125
<i>limnophilus</i>	22	<i>Vauxii</i>	125
<i>Leibii</i>	71	<i>Dentirostres</i>	122
<i>megapodius</i>	23	<i>Drymoica</i>	123
<i>minutissimus</i>	70	<i>Ducks</i>	133
<i>monticola</i>	71	<i>Emberiza hortulana</i>	121
<i>Schreiberii</i>	22	<i>palustris</i>	23
<i>subulatus</i>	72	<i>Emu</i>	130
<i>turcomanus</i>	70	<i>Euphonia cœlestis</i>	120
<i>virginianus</i>	71	<i>Eurhinorhynchus griseus</i>	131
<i>vipistrellus</i>	23	<i>Francolinus nivosus</i>	129
<i>volgensis</i>	70	<i>Fringilla cisalpina</i>	120
<i>Vesperugo Nilssonii</i>	69	<i>linaria</i>	120
<i>Xerus trivittatus</i>	88	<i>Fringillidae</i>	120
<i>Zobel</i>	78	<i>Fulica americana</i>	131
		<i>cristata</i>	35
		<i>Gallinae</i>	129
		<i>Glareola melanoptera</i>	131
		<i>orientalis</i>	132

INDEX.

AVES.		AVES.	
	Page		Page
Glareola torquata	132	Talegalla Lathamii	5, 130
Harpyhaliætos	118	Tanagridæ	120
Hirundinaccæ	125	Tinamus cinnamomea	130
Hirundo neoxena	125	Todidæ	125
Hoopoe	125	Trogon auriceps	126
		personatus	126
Lagopus subalpinus	11	Turdus varius	122
Leipoa ocellata	5, 130	Uncirostrum	124
Lipoglossæ	125	Upupa	119
Macrochires	125	Vultur isabellinus	118
Megalonyx	124		
Megapodius	129	Wagtails	123
Menura	119	Woodpeckers	127
Merganetta	133		
Minla ignostincta	120	Yellow-Hammer	121
Motacilla flava	123	Yunx æquatorialis	127
Musicapa variegata	122		
		REPTILIA.	
Ormismyia	125	Aspidorhinus	139
Osprey	118	Aturia	141
Otis australasiana	131		
tarda	129	Bitia	141
Pastor roseus	13	Boidæ	141
Pelecanus onocratulus . . .	116	Boltalia	139
Pica San-Blasiana	119	Bufo vinearum	143
Piculus	127		
Picus luridus	127	Calamaria fabæ	142
schænsis	127	Callopeltis leopardinus . . .	13
Pipra fastuosa	119	Coluber isabellinus	142
Platalea flavipes	131	Crotalidæ	141
Podiceps antarcticus	134		
longirostris	35	Daboia	142
Pogonias lævirostris	126	Dimades	141
Psittacinæ	127	Diporiphora	140
Psittocus flavifrons	128		
pullarius	114	Elaps ornatus	142
rufiventris	128	Emys europæa	136
Pteroglossus castaneorhynchus	127		
Ptelinopus Euwingii	129	Farancia	142
Puffinus major	132	Ferania	141
		Fordonia	142
Sarcoramphus condo	118		
gryphus	118	Gehyra	139
Sterna arctica	132		
nigra	116	Hatteria	140
Subulirostres	122	Higina	142
Sylvia	122	Hydraspis victoriæ	138
Sylvia locustella	115	Hydridæ	141
philadelphia	122		

MOLLUSCA.		MOLLUSCA.	
	Page		Page
<i>Bulinus simplex</i>	169	<i>Delphinula calcaroides</i>	179
<i>smaragdinus</i>	170	<i>tuberculosa</i>	180
<i>terebralis</i>	170	<i>Doris aspera</i>	187
<i>umbilicaris</i>	169	<i>depressa</i>	187
<i>Calliopæa</i>	186	<i>litturata</i>	188
<i>Cardium aquilinum</i>	191	<i>repanda</i>	187
<i>elegantulum</i>	191	<i>similis</i>	187
<i>Carinaria gracilis</i>	166	<i>Dreissena purpurascens</i>	191
<i>Carocolla cumberlandia</i>	169	<i>Eolis aurantia</i>	187
<i>edgariana</i>	169	<i>hystrix</i>	187
<i>Carychium exile</i>	173	<i>minuta</i>	187
<i>Castalia Duprei</i>	190	<i>nana</i>	187
<i>Cerithium cancellatum</i>	186	<i>obtusalis</i>	187
<i>lacteum</i>	185	<i>olivacea</i>	187
<i>procerum</i>	185	<i>pallida</i>	187
<i>Clangulus Blainvillii</i>	180	<i>rosea</i>	187
<i>Clausilia aculus</i>	171	<i>vittata</i>	187
<i>pluviatilis</i>	171	<i>Euplocamus Holbollii</i>	188
<i>ventricosa</i>	171	<i>Fasciolaria sulcata</i>	185
<i>Clavagella</i>	192	<i>Fusus follicus</i>	185
<i>Clavelina cristallina</i>	193	<i>frondosus</i>	185
<i>Clypeolum</i>	178	<i>funiculatus</i>	163
<i>Columbella ampla</i>	182	<i>Holbollii</i>	185
<i>aphthægera</i>	182	<i>imbricatus</i>	185
<i>buccinoides</i>	182	<i>Kroyeri</i>	185
<i>clathra</i>	182	<i>latericeus</i>	185
<i>digitalis</i>	182	<i>pyruloides</i>	185
<i>pulicaris</i>	182	<i>rosa-ponti</i>	163, 185
<i>Conus victor</i>	181	<i>sinuatus</i>	185
<i>Corbicula fuscata</i>	192	<i>ventricosus</i>	185
<i>Crepidula acuta</i>	186	<i>Heliacus</i>	180
<i>Cyclas Steenbuchii</i>	191	<i>Helicina antillarum</i>	172
<i>Cyclostoma auberiana</i>	171	<i>Brownii</i>	172
<i>auriculata</i>	171	<i>conica</i>	172
<i>bilabiata</i>	171	<i>cornea</i>	173
<i>candeana</i>	171	<i>crassa</i>	172
<i>cincinnatiensis</i>	171	<i>dentigera</i>	172
<i>delatreana</i>	171	<i>elegans</i>	172
<i>Gironnieri</i>	171	<i>elongata</i>	172
<i>latilabris</i>	171	<i>globulosa</i>	172
<i>maculosa</i>	171	<i>guadeloupensis</i>	172
<i>poeyana</i>	171	<i>jamaicensis</i>	172
<i>pudica</i>	171	<i>lutea</i>	172
<i>Pretrei</i>	171	<i>maculata</i>	172
<i>sagia</i>	171	<i>minima</i>	172
<i>ventricosa</i>	171	<i>pellucida</i>	172
<i>Cynthia glutinans</i>	193	<i>petitiana</i>	172
<i>Cyrena obesa</i>	192	<i>rotella</i>	173
<i>purpurea</i>	192	<i>rotunda</i>	172
<i>tenebrosa</i>	192	<i>sagraiana</i>	172
<i>Defrancia</i>	185		

MOLLUSCA.

	Page
<i>Helicina Sibani</i>	172
<i>trochulina</i>	172
<i>zephirina</i>	172
<i>Helix</i>	167
<i>candei</i>	169
<i>Chevalierii</i>	167
<i>clausa</i>	173
<i>conus</i>	168
<i>Daróndeanii</i>	167
<i>dejecta</i>	169
<i>Guerini</i>	168
<i>minoricensis</i>	167
<i>minutissima</i>	168
<i>mobilians</i>	168
<i>naninoides</i>	168
<i>nyeli</i>	167
<i>rarida</i>	168
<i>telonensis</i>	167
<i>tennesseensis</i>	168
<i>touranenses</i>	167
<i>Valtoni</i>	168
<i>zeus</i>	168
<i>Incillaria</i>	166
<i>bilineata</i>	166
<i>Io tenebrosa</i>	175
<i>Lacuna glacialis</i>	180
<i>Laguncula</i>	175
<i>Leda</i>	190
<i>Limacidae</i>	166
<i>Limacina bales</i>	165
<i>Limax agrestis</i>	164
<i>Lithedaphus</i>	186
<i>Lucina cristata</i>	191
<i>Lymnea minor</i>	174
<i>plicatula</i>	174
<i>Mangelia Holbollii</i>	184
<i>Margarita costulata</i>	180
<i>glauca</i>	180
<i>vahllei</i>	180
<i>Marginella albolineata</i>	181
<i>caribaea</i>	181
<i>lavalleeana</i>	181
<i>ovuliformis</i>	181
<i>sultriplicata</i>	181
<i>Melania</i>	175, 176
<i>brevis</i>	176
<i>conica</i>	176
<i>coronata</i>	176
<i>crassa</i>	176
<i>cubaniana</i>	176

MOLLUSCA.

	Page
<i>Melania flammulata</i>	175
<i>glans</i>	176
<i>granum</i>	176
<i>ornata</i>	176
<i>semigranosa</i>	176
<i>terebra</i>	176
<i>testudinaria</i>	176
<i>torquata</i>	176
<i>Winteri</i>	175
<i>zonata</i>	176
<i>Meliboea ornata</i>	187
<i>Menestho</i>	176
<i>Mitra affinis</i>	181
<i>anaïs</i>	181
<i>casta</i>	163
<i>grœnlandica</i>	181
<i>obliqua</i>	181
<i>virginalis</i>	181
<i>Modiola Chenui</i>	191
<i>cicercula</i>	191
<i>elliptica</i>	191
<i>pulex</i>	191
<i>senhousia</i>	191
<i>Murex brandaris</i>	184
<i>cleryi</i>	184
<i>Mytilus edulis</i>	191
<i>niger</i>	191
<i>Natica</i>	179
<i>affinis</i>	179
<i>alba</i>	179
<i>lacernula</i>	179
<i>nana</i>	179
<i>pygmæa</i>	179
<i>rhodostoma</i>	179
<i>sagraiana</i>	179
<i>septentrionalis</i>	179
<i>uberina</i>	179
<i>Nautilus pompilius</i>	165
<i>Neripteron</i>	178
<i>Neritæ</i>	178
<i>Neritinae</i>	178
<i>Neritina armstrongiana</i>	178
<i>Gaimardii</i>	178
<i>gigas</i>	178
<i>microstoma</i>	178
<i>tristis</i>	178
<i>vestita</i>	178
<i>Nucula</i>	189
<i>Odontostoma</i>	171
<i>depressa</i>	172
<i>globulosa</i>	172

MOLLUSCA.		MOLLUSCA.	
	Page		Page
Odontostoma lævissimum	165	Ringicula semistriata	181
rugulosum	165	Rissoa marmorata	177
Olivina miliola	181	obtusa	177
Paludetrina	175	plica	177
Paludina bermondiana	175	punctum	177
Breughelii	174	sabulum	177
lecythoides	174	subventricosa	177
longicornis	175	Rossia Jacobii	165
obtusa	175	Owenii	165
quadrata	174	Rotella anomala	180
regularis	175	carinata	180
seminalis	175	diaphana	180
striatula	175	semistriata	180
subfusca	174	striata	180
troostiana	175	Sanguinolaria iridescens	192
Pandorina arenosa	192	Scalaria albida	177
Partula Dumartroyii	170	candeana	177
inflata	170	echinaticosta	177
Pasithea sordida	177	Eschrichtii	177
Patella cerea	188	foliaceicosta	177
insessa	188	hotessieriana	177
Patelloida depicta	188	uncinaticosta	177
Pecten glaber	189	Scarabus lekithostoma	173
Peplidia	188	pollex	173
Phasionella brevis	181	pyramidatus	173
umbilicata	181	Sepiola	165
zebrina	181	Sigaretus helicoidens	179
Pholadomya candida	192	Solarium	180
Pirena atra	175	bisulcatum	180
aurita	175	delphinuloides	180
Planaxis arcolatus	182	inornatum	180
circinnatus	182	Strombus australis	184
Planorbis bellus	174	chemnitzii	184
buchanensis	174	coniformis	183
hemisphæcula	174	dubius	183
papyraceus	174	elegans	183
regularis	174	fusiformis	184
Pleurotoma funiculata	184	hæmostoma	184
perlata	184	glabratus	184
Polycera ocellata	187	ponderosus	184
Psammbia decora	192	Sibbaldii	183
Pupa Hoppii	171	terebellatus	184
Pupina aurea	173	Struthiolaria gigas	183
mitis	173	Succinea	167
Purpura aterrima	183		
avenacea	183	Tergipes rupium	188
bicolor	183	Thracia inæqualis	192
violacea	183	myopsis	192
Risinja iodostoma	182	Tritonia felina	187
monstruosa	183	pulchella	187
rufostoma	183	Trochus canaliculatus	180
		hotessierianus	180

INSECTA.	Page	INSECTA.	Page
Chilonycha	204	Dicrotelus	303
Chilotomus	208	Diospolis	304
Chironomidæ	292	Diraphia	305
Chloealtis	269	Dixa nigra	293
<i>abortiva</i>	270	Dolichogyna	298
<i>conspersa</i>	270	Dolichopidæ	296
<i>curtipennis</i>	270	Dorcus parallelopipedus	229
Chrysididæ	279	Doros	297
Chrysomelidæ	258	Dorylidæ	281
Chrysomelinæ	257	Dynastidæ	234
Cheirolasia	238	Dytisci	212
Cicadiedæ	304		
Cicindela	204	Elachista coffeela	292
<i>campestris</i>	205	Elateridæ	215
Cicindelidæ	203	Empidæ	295
Clerii	218	Endomychidæ	261
Clerus	220	Engis	261
Cnemoplites	252	Ennomos illunaria	290
Coccinellidæ	261	Enoplium	222
Cœloprosopus	207	Epiteles	223
Coleotichus	301	Erotyli	260
Colpochila	236	Erotylidæ	259
Colydii	249	Erymanthus	221
Colymbetes consputus	212	Euchroa	253
Conocephalus ensiger	267	Eucnemides	215
Conopsidæ	298	Euryoda	204
Coroidæ	302	Eusthenia	271
Coriplatus	302	Evanidæ	277
Corymbites	216	Exochostoma	296
Corynetes	222		
Cossiphidæ	242	Forficula gigantea	262
Crabronidæ	279	Forficulidæ	263
Crepidomenus	215	Formica rufa	281
Cryptocephali	258	Formicariæ	281
Cucujipes	250	Fulgoridæ	303
Cucujus depressus	250		
Culicidæ	292	Galgulidæ	303
Curculionidæ	245	Gelechia lapella	291
Cylidrus	219	Geometridæ	290
Cylistus	222	Geotrogus	235
Cynipidæ	277	Geotrupidæ	233
Cyphonidæ	217	Glycia	207
Cyphosoma	209	Gnathoxys	208
Cystosoma	305	Goliathidæ	238
		Gonia	299
Danaides	286	Gryllotalpa vulgaris	265
Deinacrida heteracantha	266	Gynantocera	287
Derbe	303	Gyrini	213
Deretaphrus	248		
Dermestini	227	Halipilus	213
Diacanthus	216	Halticæ	259
Dianthæcia luteago	289	Helopiæ	242
Dicenopsis	258	Helluonides	206

INSECTA.		INSECTA.	
	Page		Page
Hemerobii	273	Lyda	276
Hemiopa	216	Lygæites	303
Hesperidæ	287	Lytha	244
Heteroceridæ	228		
Heteromera	201	Macroductyli	228
Hexaphyllus	240	Macroductylus subspinosus	239
Hirteidæ	293	Macroderes	230
Histeres	226	Mantides	263
Homothæ	209	Mastax	268
Hopliariæ	234	Mecynopus	253
Hybotinidæ	295	Megacantha	241
Hydrophilidæ	228	Megacephala	204
		senegalensis	203
Ichneumonidæ	276	Megalostylus	208
Idiocephala	258	Megaspis	298
Inatisma	298	Meloe	244
Iontha	289	Melolonthæ	236
Iresia	203	Melipones	283
Isodermus	303	Melolonthidæ	234, 236
Isonotus	279	Melolonthanæ	234
		Melyrides	218
Kollaria	271	Membracideæ	304
		Metopon	246
Lachnus	305	Midasidæ	294
Lagriariæ	243	Migadops	208
Lamellicornes	229	Minurus	246
Lamiæ	254	Mitocera	258
Lamprima	240	Mixogaster	298
Lampyridæ	217	Molpus	209
Langelandia	248	Monota 4-foveolatum	262
Lathridii	261	Mordelliones	243
Lathrobium angusticolle	214	Muscaridæ	299
longicorne	214	Mutillariæ	281
Latometus	248	Myrmecilla pygmæa	204
Lema Suffriani	257	Myrmica radiana	282
Lepismenæ	272	Mysidia	304
Leptidæ	294	Mystropterus	208
Lestignathus	209		
Lobodontus	207	Nanos	230
Locusta æqualis	269	Nemoura	272
caudata	267	Nepticula	291
eucerata	269	Nepytis	236
latipennis	269	Nesioticus	240
maritima	269	Nicoletia	272
marmorata	269	Nitidulariæ	225, 226
nebulosa	269	Nitidulinæ	225
Locustidæ	262, 267	Nithia	306
Longicornes	251	Noctuidæ	288
Lophocheilus	280	Notoxus	243
Loxomerus	208	Nymphalidæ	286
Lucanidæ	240		
Lycærides	286	Ochropsis	258
Lycidæ	218	Ochthenomus	243

INSECTA.	Page	INSECTA.	Page
Odontoderus	259	Psyllidæ	305
Odontocheila	264	Pterelachisus	293
Oestracidæ	298	Pteronarcyæ	271
Ogcosoma	241	Ptinioreæ	223
Onthoclaris	230	Ptiolina	294
Opatridæ	241	Ptychopterus	221
Ophryodactylus	209	Pupipara	300
Opilus	221	Pycnomerus	248
Orchelimum gracile	267	Pyralidæ	290
vulgare	267	Pylus	223
Orectochilus villosus	213		
Oryctomorphus pictus	234	Reduvini	303
Osmia ferruginea	283	Rhipiceridæ	217
Oxynterus	216	Rhipidocerus	252
		Rhizotrogus	235
Pæderus lusitanicus	214	Rhombodera	207
Palpatores	224	Rhopalocerus ferrugineus	209
Papilionidæ	284	Rutelidæ	234
Paranomus	209		
Paropsis	258	Salpingidæ	243
Patara	304	Sapygites	280
Paussidæ	250	Saragus	242
Pedilophorus	227	Sarrotrium muticum	249
Pelidnota punctata	234	Satyridæ	286
Pentatomidæ	301	Scariphites	207
Penthetria holosericea	294	Scaritidæ	211
Perla	271	Scitula	236
Perlaridæ	270	Sclethrus	253
Phaasma conocephalum	264	Scopodes	207
Phænognathus	236	Sericariæ	234
Phenice	304	Sesiaridæ	287
Phlæostichus	250	Silopa	236
Phyllodioma	204	Silpha	224
Phyllophaga	236	Silphales	224
Phylloporidæ	215	Simplocaria	227
Physodeutera	204	Siricis	275
Pierides	285	Spalacopsis	256
Pimelopus	234	Spectra	264
Plagiocera	298	Sphagidæ	279
Platissus	250	Sphenarium	267
Platycheirus	297	Sphingidæ	287
Polochrum repandum	280	Staphylini	213, 214
Pompilus audax	280	Stemmoderus	250
Prinobius	252	Sterculia splendida	214
Priocera	220	Stilbia stagnicola	289
Prionidæ	251	Stratiomydæ	296
Pristilophus	216	Stridulantes	305
Probenops dromedarius	301	Strongyliæ	225
Prosopis	282	Synercticus	223
Psammodaphnia	280	Syrphidæ	227
Psephenidæ	262	Systropus	295
Pseudocephalus	256		
Psychopsis	274	Tabanidæ	294

INSECTA.

	Page
Tachydromidæ	295
Tachynomyia	280
Telephoridæ	218
Telura	236
Temnoplectron	230
Tenebriones	240
Tenthredinidæ	275
Termitina	270
Tetracha	203
Tettigonia fabæ	305
vitis	305
Thallis	261
Thecla isocrates	286
Thracia	304
Thynnidæ	280
Tillus	219
Tineidæ	291
Tinesorrhina	239
Tomicephalus	216
Tortricidæ	290
Tragocephala	269
infuscata	269
radiata	269
Trichodes	221
Triplax nigripennis	261
Trogidæ	233
Trogositinæ	226
Trypeta signata	300
Tupularidæ	293
Ulodes	242
Uroxys	230
Vesicantia	244
Vespareæ	282
Volucella inanis	297
plumata	297
Xanthocerus	223
Xyletinus ornatus	224
Xylophagidæ	294
Zeugma	304
Zophius	241

ARACHNIDA.

Acari	312
land	311
marsh	311
running	312
Acarus of Crosse	313
folliculorum	313

ARACHNIDA.

	Page
Ællopus	310
Argyroneta	309
aquatica	309
Cosmetus flavicinctus	311
Drassidæ	308
Dysderidæ	309
Eupodides	312
Galeodes	310
Galeodidæ	310
Gluvia	310
Holothyrus	312
Hydrachnides	311
Hygrobatides	311
Lathrodictus 13-guttatus	308
Malmignatto	308
Mygalidæ	308
Obisidæ	310
Phalangodes	311
Phrynidæ	309
Phrynus medius	309
Rhax	310
Rhyncolophides	312
Scorpionidæ	310
Scorpius occitanus	310
Solpuga	310
Spermophora	309
Teratodes	309
Trombidides	312

CRUSTACEA.

Albunhippa	317
Ampelisca	319
Anonyx	320
Argis	318
Asellota	320
Astacini	317
Caprella	320
spinosa	320

ARACHNIDA.		ENTOMOSTRACA.	
	Page		Page
Caprellina	320	Anatifa	323
Carcinus olivaceus	314	Branchipus torricornis	322
Carides	317	Caligus	323
Cardioides	318	Cirripedia	323
Crangon	318	Isaura	321
Cuma	318	Isotelus megistos	323
Cytisoma	320	Phyllopoda	321
Eurynolambrus	316	Siphonostoma	322
Grapsoidei	316	ANNELIDES.	
Hippides	317	Aeolosoma	327
Hippolyte	317	Amphitrite auricoma	327
polaris	316	Aphrodites	324
Homolii	317	Aricie	326
Hyperina	320	Borlasia striata	331
Hypolyte Desmarestii	316	Chaetogaster	326
Lafystius	319	Clepsine sanguinea	330
Oediceros	319	Eteone cylindrica	325
Opis	318	Euphrosine borealis	324
Paranephrops	317	Geoscolex	328
Pardalisca	319	maximus	329
Parthenopii	318	Glycera setosa	326
Pephredo	314	Heteronereis	325
Photis	319	arctica	325
Phoxus	319	Hirudo piscium	330
Podocerus Leachii	319	Leech	330
Pontoporeia	319	Lumbricina	329
Promedeia	319	Lumbriconais	326
Pycnogonides	314	Myrostrum	332
Sabinea	318	cirriferum	332
Sesarma tetragona	314	costatum	332
Stegocephalus	319	glabrum	332
Tanais	320	Naides	326
MYRIOPODA.		Nais littoralis	326
Chilognatha	321	uncinata	326
Chilopoda	321	Nephtys longisetosa	325
Gonibregmatas	321	Nereis	329
Mecistocephalus	321	Nereides	325
Necrophlæophagus	321		
Scolopendrella	321		

ANNELIDES.

	Page
<i>Onuphis Eshrichtii</i>	324
<i>Ophelia bicornis</i>	326
<i>inamillata</i>	326
<i>Peripatus juliformis</i>	328
<i>Phyllodoce groenlandica</i>	325
<i>incisa</i>	325
<i>Polybostrichus</i>	325
<i>Serpentina</i>	326
<i>Siphonostoma diplochaitos</i>	327
<i>plumosum</i>	327
<i>Scoloplos minor</i>	326
<i>Sternaspis thalassemoides</i>	328

ENTOZOA.

<i>Amphistomum subclavatum</i>	347
<i>Ascarides</i>	346
<i>Ascaris incisa</i>	344
<i>nigrovenosa</i>	344
<i>Aspidogaster</i>	356
<i>Bothrimonus sturionis</i>	358
<i>Cænurus cerebialis</i>	359
<i>Cercaria</i>	350
<i>echinata</i>	351
<i>Cyclocotyle lanceolatum</i>	350
<i>Cysticercus cellulose</i>	358
<i>cercopithecii</i>	359
<i>elongatus</i>	359
<i>pisiformis</i>	359
<i>Diplobothrium</i>	348
<i>armatum</i>	349
<i>Distomum hepaticum</i>	348
<i>truncatum</i>	348
<i>veliporum</i>	348
<i>Echinococcus hominis</i>	360
<i>Echinorhynchi</i>	346
<i>Filarie</i>	342, 345, 346
<i>Filaria papillosa</i>	345
<i>Gordius aquaticus</i>	336
<i>tolosanus</i>	340
<i>Gregarina</i>	360
<i>Hæmatozoa</i>	361
<i>Hexacotyle elegans</i>	349

ENTOZOA.

	Page
<i>Mermis</i>	342
<i>nigrescens</i>	340
<i>Monostomum expansum</i>	347
<i>mutabile</i>	347
<i>Octobothrium</i>	349
<i>leptogaster</i>	350
<i>merlangi</i>	349
<i>palmatum</i>	350
<i>sagittatum</i>	350
<i>Oxyuris vermicularis</i>	344
<i>Peltogaster paguri</i>	357
<i>Physaloptera clausa</i>	345
<i>Polystomum integerrimum</i>	348
<i>Schistocephalus dimorphus</i>	354
<i>Spermatozoa</i>	362
<i>Sphærolaria bombi</i>	345
<i>Spiroptera nasicola</i>	344
<i>Strongylus armatus</i>	343
<i>filaria</i>	343
<i>gracilis</i>	343
<i>Tetrarhynchus cysticus</i>	358
<i>Trematoda</i>	356
<i>Trichocephalus affinis</i>	342
<i>dispar</i>	342
<i>Tristomum coccineum</i>	348
<i>Vertumnus thetidicola</i>	362
<i>Vibrio tritici</i>	346

ECHINODERMATA.

<i>Amphiope perspicillata</i>	368
<i>Anoplosomatum</i>	365
<i>Asteriadae</i>	370
<i>Asteracanthion</i>	371
<i>Asterias</i>	371
<i>Asterias angulosa</i>	373
<i>sanguinolenta</i>	373
<i>Asteronyx Loveni</i>	373
<i>Astrophyton</i>	373
<i>Clypeastroides</i>	367
<i>Comatulæ</i>	374
<i>Echinidae</i>	367
<i>Echinus</i>	369
<i>sexatilis</i>	369
<i>Encope</i>	368

ECHINODERMATA.		ACALEPHÆ.	
	Page		Page
Euryalæ	372	Medusa aurita	377
verrucosa	373	Pelagia noctiluca	376
Goniaster equestris	364	Physophora tetrasticha	377
Holothuriæ	365	Stephanomia contorta	377
Hoplodactylus	365	Strobila	377
Laganum	368	Thaumantias	376
rostratum	367	pileata	376
Lobophora	368	punctata	376
Mellita lobata	368	sarnica	376
similis	368	Thompsonii	376
Ophiocoma Goodsiri	364	Velella	378
minuta	364		
neglecta	364		
Ophiolepis aculeata	373		
Ophionyx armata	373		
Ophiuridæ	371		
Ophiura albida	364		
Ophiuræ	372		
Pentacrinus caput medusæ	374		
Phyllophorus	365		
urna	365		
Scutellæ	367		
Sipunculus nudus	365		
Synapta duvenæa	365		
Trichaster	378		
ACALEPHÆ.		POLYPI.	
Æquorea violacea	375	Actinia of the ^{Egean} Sea	379
Beroë Forskalii	375	mesembryanthemum	381
Cyanea capillata	377	Actiniæ	381
coccinea	376	Alcyonium exos	382
Cyditpe pomiformis	374	Alcyonidium stagnorum	385
Diphya elongata	378	Bacillariæ	391
Hippocrene	375	Bebryce mollis	381
britannica	376	Bicellaria scruposa	385
Bugainvillii	375	Bursaria vernalis	390
octopunctata	376	Capnea	379
Leagneuria vitrea	375	sanguinea	379
Medusæ	376	Cellularia avicularia	385
		Corallinæ	387
		Corynæ fritillaria	383
		Cyathinæ	382
		Cycloum	382
		papillosum	382
		Dipodina arctiscon	388
		Echinochorium	383
		clavigerum	383
		Edwardsia	380
		Beautempsii	380
		Harassi	380
		timida	380
		Eleutheria dichotoma	384
		Euplectella aspergillum	387
		Evagora rosea	382
		Fungia	381
		Gallionellæ	391

INDEX.

. xix

POLYPI.	Page	POLYPI.	Page
Herpolitha	381	Paramecium aurelia	389
Hydatine senta	389	Pardorina morum	390
Hydra grisea	382	Pennatula	382
viridis	383	Peridinium tripos	390
Hydractinia	384	Plumatella	385
		repens	385
Infusoriæ	388, 389	Polythalamia	387
Isis elongata	382		
		Rotatoria	388
Lagenella	390		
Lepraliæ	384	Sarcoclitum	382
Lithophytes	386	Snow, red	390
		Sponges	385, 387
Monades	391, 392		
		Veretillum cynomorium	382
Navicula	390	Vibrio cyanogenus	391
viridis	392	Vibrionæ	391

FINIS.

REPORT
OF THE
FIRST ANNUAL MEETING
OF
THE RAY SOCIETY,

OCTOBER 2, 1844.

SIR PHILIP DE MALPAS GREY EGERTON, BART.

IN THE CHAIR.

WITH
THE LAWS OF THE SOCIETY, LIST OF OFFICERS, MEMBERS,
&c. &c.

LONDON:
C. AND J. ADLARD, BARTHOLOMEW CLOSE.

THE RAY SOCIETY.

The Secretary Dr. LANKESTER, read the following Report :

THE Society whose first Annual Meeting we are met to commemorate, had its origin in a wish, expressed by Dr. JOHNSTON of Berwick, to some of his scientific friends, that some means could be devised for printing such works on Natural History, as stand in need of extraneous assistance to ensure their publication. The scientific value of zoological and botanical works is generally in the inverse ratio to their popularity, and it often happens that the authors of profound scientific researches are compelled, either to make their writings popular, or to incur the inevitable loss consequent on publishing, on their own account, works whose circulation is confined to lovers of science only. In cases of this kind it has been usual to apply for aid to Her Majesty's Government, but though assistance has been occasionally obtained from this source, yet there are many difficulties attending such applications. These difficulties were sensibly felt last year at the Cork meeting of the British Association, when several elaborate MS. works on various departments of Natural History were laid before the Association, and their claims on its assistance were backed by the influence of the Sectional Committees, but, from the limited state of its funds, the Association was unwillingly compelled to withhold the desired aid. Here then were several original researches of great value to science returned upon the hands of their authors, merely because the booksellers would not incur the risk of their publication, while scientific bodies were unable to assist them. To rescue such precious materials from oblivion, is one of the objects for which the RAY SOCIETY was instituted, and it has been ascertained that by applying the whole funds of the Society, with rigid economy, to the printing and issuing appropriate volumes on the plan of the Camden, Sydenham, and other similar Societies, a large dividend of scientific matter may be annually distributed to the Subscribers. In carrying out this project, however, the Society will carefully avoid interfering with the interests of the book trade, or of scientific societies, and to quote the words of our own regulations, "It will be a direction to the Council that they shall not print any thing that appears to them suitable to the transactions of established societies, nor any work which a respectable publisher shall undertake to publish without charge to the author."

The RAY SOCIETY does not, however, confine itself to printing original matter, but will include in its objects the editing, translating, and reprinting of rare or inaccessible works of really scientific value.

Aware how imperfectly the majority of British naturalists are acquainted with the state of their science in foreign countries, the Council considered that they could not better occupy their first volume than by giving translations of several recent Reports on the state of Zoology and Botany, which have appeared on the continent. It was hoped that this volume could have been got ready in time for the present meeting, but although every exertion has been used, we shall be compelled to await its appearance a few months longer. Some of the proof sheets have however been bound into a volume, to serve as a specimen of the form in which it is proposed that the works shall be issued.

In preparing works for our future volumes, a very numerous list of proposed publications has been laid before the Council, among which it has been decided to publish the following at an early period.

I. Memorials of JOHN RAY; consisting of the 'Life of JOHN RAY,' by DERHAM; the 'Biographical Notice of RAY,' by Baron CUVIER and M. DUPETIT THOUARS, in the Biographie Universelle; published and unpublished Letters of RAY, &c. Edited by E. LANKESTER, M.D.F. L.S.

II. 'Iconographia Linnæana,' to be published in parts, and to consist of Illustrations of the original specimens in Zoology of Linnæus, at present existing in the Museum of the Linnæan Society. Edited by Professor BELL, F.R.S., and Professor FORBES, F.R.S.

Of this the Council intend publishing a part yearly or half-yearly, as their resources will permit.

III. A 'Monograph,' with coloured drawings, of every species of the British Nudibranchiate Mollusca, by Messrs. ALDER and HANCOCK; in parts.

Without pledging themselves to publish all the following works, the Council present the names of some which have been brought before them for consideration :

1. A Translation from the Greek, with Notes, of the Works of ARISTOTLE on Animals, and of DIOSCORIDES on Plants.
2. A Translation from the Spanish of Azara's Birds of Paraguay.
3. An edition of the 'Systema Naturæ' of Linnæus.
4. A Translation from the German of the 'Principles of Philosophical Botany' of Dr. J. M. SCHLEIDEN.

In regard to the portion of our publications which are now in actual progress, we have to express our thanks to W. B. MACDONALD, Esq., to Dr. LANKESTER, and to H. E. STRICKLAND, Esq., for their assistance in translating and editing the several Reports on the state of Zoological and Botanical Science, which will occupy the first volume.

We are happy to announce that upwards of 400 Members have already joined this Society, and additional names are daily added to our list. We feel confident that as soon as its objects and merits become known on the Continent, a large number of foreign naturalists will join our ranks. We would urge on all well wishers to the RAY SOCIETY, the importance of making it extensively known and supported by their scientific friends, as its utility to science, and its advantages to each individual Member, will be exactly proportionate to the amount of its annual income.

The Treasurer's Accounts were then laid before the Society, an abstract of which follows:

The RAY SOCIETY in Account with J. S. BOWERBANK, from
MARCH 13, to OCTOBER 3, 1844.

	£	s.	d.		£	s.	d.
Stationery, Stamps, and Postage .	2	14	6	Cash from 225 Sub-			
Dr. Johnston's Account £6 10 0				scribers .	236	1	0
Ditto P. O Orders 1 3							
	6	11	3				
Dr. Lankester's Account 11 13 2							
Ditto ditto . 9 13 5							
	21	6	7				
E. Newman's Account 5 6 0							
Ditto ditto 5 13 6							
Ditto ditto . 5 5 0							
	16	4	6				
	46	16	10				
Balance . . .	189	4	2				
	£236	1	0				
					£236	1	0

The above Accounts, extending from March 13 to October 3, 1844, have been examined by us, and compared with the vouchers, and found to be correct.

(Signed) EDWIN J. QUEKETT,
ROBERT WARINGTON.

Nov. 15, 1844.

1. Moved by Lord NORTHAMPTON; Seconded by the **DEAN** of
Manchester;

That the Report now read, be received and adopted.

2. Moved by R. I. MURCHISON, Esq.; Seconded by Dr. HUGH
FALCONER;

That the thanks of this Meeting be given to Mr. BOWERBANK,
 Treasurer; to Dr. JOHNSTON, and to Dr. LANKESTER, Secretaries,
 and to the Local Secretaries, for their services.

3. Moved by Sir HENRY DE LA BECHE; Seconded by Professor
ANSTED;

That the following gentlemen be the Council for the ensuing
 year.

CHARLES C. BABINGTON, ESQ.

J. H. BALFOUR, M.D.

ROBERT BALL, ESQ.

THOMAS BELL, ESQ. F.R.S.

REV. M. J. BERKLEY.

GEORGE BUSK, ESQ.

J. DALRYMPLE, ESQ.

C. DAUBENY, M.D. F.R.S.

SIR P. G. EGERTON, BART. F.R.S.

EDWARD FORBES, ESQ. F.R.S.

R. K. GREVILLE, ESQ.

SIR W. JARDINE, BART.

REV. L. JENYNS.

RICHARD OWEN, ESQ. F.R.S.

JOHN PHILLIPS, ESQ. F.R.S.

J. T. ROYLE, M.D. F.R.S.

PRIDEAUX SELBY, ESQ.

HUGH E. STRICKLAND, ESQ.

W. THOMPSON, ESQ.

N. B. WARD, ESQ.

4. Moved by A. STRICKLAND, Esq.; Seconded by Professor ALLMAN;

That the thanks of this Meeting be given to the Chairman, Sir
 PHILIP DE MALPAS GREY EGERTON, Bart., for his kindness in
 presiding on the present occasion.

LOCAL SECRETARIES.

Aberdeen	..	..	..	Dr. Dickie.
Beccles	..	..	..	H. Davey, Esq.
Bury St. Edmunds	..	..	..	Dr. Ranking.
Chelmsford	..	..	..	G. Meggy, Esq.
Cork	..	..	..	Dr. Harvey.
Derby	..	..	..	R. J. Bell, Esq.
Edinburgh	..	..	..	Dr. Douglas MacLagan.
Gloucester	..	..	..	J. M. Hitch, Esq.
Godalming	..	..	..	J. D. Salmon, Esq.
Halifax	..	..	..	Dr. Inglis.
Hatfield	..	..	..	Lloyd Thomas, Esq.
Hereford	..	..	..	T. Tucker Price, Esq.
Hertford	..	..	..	Dr. Reed.
Hull	..	..	..	G. Norman, Esq.
Leeds	..	..	..	T. P. Teale, Esq.
Leicester	..	..	..	J. Harley, Esq.
Liverpool	..	..	..	Dr. Dickenson.
Manchester	..	..	..	Peter Barrow, Esq.
Newcastle-on-Tyne	..	..	..	J. Thornhill, Esq.
Norwich	..	..	..	T. Brightwell, Esq.
Plymouth	..	..	..	Rev. J. Hore.
Reading	..	..	..	— Lovejoy, Esq.
Ryde, Isle of Wight	..	..	..	Dr. Bell Salter.
Scarborough	..	..	..	Dr. Murray.
Tenby, South Wales	..	..	..	Dr. Falconer.
Torquay	..	..	..	Dr. Battersley.
Winchester	..	..	..	Dr. A. D. White.
Witham	..	..	..	Jacob H. Pattisson, Esq.
Worcester	..	..	..	Dr. Streeten
York	..	..	..	W. M. Tuke, Esq.

THE FOLLOWING MEMBERS OF THE COUNCIL.

Belfast	..	..	..	W. Thompson, Esq.
Cambridge	..	..	..	Charles C. Babington, Esq.
Dublin	..	..	..	Robert Ball, Esq.
Glasgow	..	..	..	J. H. Balfour, M.D.
Greenwich	..	..	..	George Busk, Esq.
King's Cliffe	..	..	..	Rev. M. J. Berkley.
Oxford	..	..	..	C. Daubeny, M.D. F.R.S.

THE LAWS OF THE RAY SOCIETY.

I. That this Society shall be called **THE RAY SOCIETY**; and that its object shall be the promotion of Natural History, by the printing of original works in Zoology and Botany; of new editions of works of established merit; of rare Tracts and MSS.; and of translations and reprints of foreign works which are generally inaccessible from the language in which they are written, or from the manner in which they have been published.

N.B.—It will be a direction to the Council that they shall not print anything that appears to them suitable to the Transactions of established Societies; nor any work which a respectable publisher shall undertake to publish without charge to the author.

II. Every subscriber of One Guinea annually to be considered a Member of the Society, and to be entitled to one copy of every book published by the Society during the year to which his subscription relates; and no Member shall incur any liability beyond the annual subscription.

III. That the annual subscriptions shall be paid in advance, and considered to be due on the 2d day of February in each year; and that such Members as do not signify their intention to withdraw from the Society before the 2d day of June, shall be considered to continue Members, and be liable for the year's subscription.

IV. The management of the Society shall be vested in a Council of Twenty-one Members, of whom one third shall have their stated residences in London, and all of whom shall be eligible for re-election at the annual meeting.

V. That the Council hereafter shall be elected by the Members, at a meeting to be held at the time and place of the meeting of the British Association for the Advancement of Science, and that no Member whose subscription is in arrear be allowed to vote at any meetings.

VI. That the Council shall elect two Secretaries (one of whom shall be resident in London) and a Treasurer, who shall *ex officio* be Members of the Council.

VII. The annual subscription shall be deposited in a chartered bank, in the name of the Treasurer and two Members of the Council.

VIII. The accounts of the receipt and expenditure of the Society shall be examined annually by two Auditors appointed by the Council; the Auditors to be Members of the Society, who are not Members of Council, and their statement circulated among the Subscribers.

IX. That the number of copies of the Society's publications shall, unless otherwise directed by the Council, be limited to the number of actual Subscribers who shall have been enrolled, and paid their subscriptions, on or before the 2d day of June.

X. That the Editors of Works published by the Society be entitled to a number of copies, not exceeding 20, as may be decided by the Council.

LIST OF SUBSCRIBERS.

Academy, Royal Irish
 Adlard, C. and J. Bartholomew Close
 Ainslie, W. esq. Woodhill, by Ripley, Surrey
 Alder, Joshua, esq. Newcastle-on-Tyne
 Alford, — esq. Taunton
 Alison, W. P. Professor, M.D. Edinburgh
 Allanson, J. esq. Infirmary, Leeds
 Allcard, John, esq. F.L.S. &c. Stratford-green, Essex
 Allchin, W. H., esq. M.B. University College
 Allis, Thomas H., esq. York
 Allman, Professor, Dublin
 Ansted, D. T. esq. M.A. F.R.S. Professor of Geology, King's College
 Ashmolean Museum, Oxford
 Atkinson, Rev. J. C., B.A. 7, Victoria place, Scarborough
 Austin, R. A. C. esq. SEC. G.S. &c. Merrow, Guildford, Surrey

 Babington, C. C. esq. M.A. F.L.S. G.S. &c. St. John's College, Cam.
 Babington, C. esq. B.A. St. John's College, Cambridge
 Backhouse, W. J. esq. Darlington
 Bailey, — esq. Museum of Economic Geology
 Baird, Rev. John, Yetholm, Roxburgshire
 Baird, W. M.D. British Museum
 Baker, Robert, esq. Writtle, Essex
 Balfour, Professor, M.D. F.L.S. Glasgow
 Ball, John, esq. B.A. M.R.I.A. &c. 85, Stephen's green, Dublin
 Ball, Robert, esq. M.R.I.A. V.P. Geol. Soc. Dub. 3, Granby row, Dub.
 Balloch, Robert, esq. 177, West Regent street, Glasgow
 Banks, Dr. Dublin
 Barf, A. esq. 7, Paradise place, Hackney
 Barnes, Rev. H. F. Ryde, Isle of Wight
 Barker, T. esq. Surgeon, York
 Barrow, Peter, esq. 7, Clifford street, Manchester
 Bartlett, J. P. esq. Browne House, near Canterbury

- Battersley, Dr. Torquay
 Baxter, W. esq. Botanic garden, Oxford
 Bayton, Rev. W. S. Chichester, Sussex
 Bean, W. esq. Scarborough, Yorkshire
 Bearpark, G. E. esq. 74, East street, Leeds
 Beatty, Professor, T. E. M.D. M.R.I.A. Merriion square, Dublin
 Beauchamp, H. esq. Taunton
 Belfast Library, Natural History Society
 Bell, J. T. esq. 18, Aberdeen place, Maida hill, Paddington
 Bell, Matthew, esq. M.P. F.H.S. &c. Grosvenor crescent, Belgrave sq.
 Bell, Professor, F.R.S. L.S. G.S. &c. New Broad street, City
 Bell, Robert, J. esq. Mickleover House, near Derby
 Bell, Miss, East Shafto, by Morpeth, Northumberland
 Bennett, James Risdon, M.D. 24, Finsbury place
 Bennett, J. T. esq. F.R.S. F.Z.S. SEC. L.S. &c. British Museum
 Benson, John, esq.
 Berkeley, Rev. M. J. M.A. F.L.S. &c. King's Cliffe, Wansford
 Bidwell, H. esq. Wellington, Salop
 Bird, George, esq. Tollerton, near Alne Station, Yorkshire
 Birkbeck, H. esq. Keswick, near Norwich
 Birkbeck, Morris, esq. Bradford, Yorkshire
 Blackie, W. G. esq. Villa-field Printing Office, Glasgow
 Blackwall, John, esq. Oakland, near Llanrwst, Denbighshire
 Bladon, W. jun. esq. Taunton
 Blood, J. Howell, esq. White Hall, Witham, Essex
 Bodenham, F. S. esq. Hereford
 Bompas, — esq. Bristol
 Bold, T. J. esq. 24, Cloth Market, Newcastle-on-Tyne
 Bonar, Miss, Kimmerghame, or 11, Chester place, Regent's park
 Bonville, A. C. de, esq. Corpus Christi College, Cambridge
 Borrer, W. esq. F.R.S. L.S. &c. Henfield, Sussex
 Botfield, J. B. esq. M.P. F.R.S. L.S. &c. 9, Stratton street
 Bowerbank, E. S. esq. Sun street, Bishopsgate
 Bowerbank, J. S. esq. F.R.S. G.S. &c. 45, Park street, Islington
 Brackenridge, G. W. esq. F.S.A. G.S. &c. Bromwell House, Brislington,
 Bristol
 Bramley, L. esq. Halifax, Yorkshire
 Brandsby, Rev. John, M.A. F.L.S. C.P.S. &c. Lynn, Norfolk
 Branton, John, esq. Bush Hall, near Hatfield
 Bree, Robert Charles, esq. Stowmarket, Suffolk
 Brisbane, Sir T. M. Bart. K.C.B. K.C.H. D.C.L. F.R.S.E. &c. Mackers-
 town, near Kelso
 Brightwell, T. esq. F.Z.S. Norwich
 Broderick, W. esq. Belford

- Brodhurst, B. esq. London Hospital
 Bromfield, W. A. M.D. Ryde, Isle of Wight
 Broome, C. E. esq. 1, Chesterfield place, Clifton, Bristol
 Brown, Edwin, esq. Burton-on-Trent
 Brown, Thomas, esq. surgeon, Finsbury pavement
 Brown, Robert, D.C.L. F.R.S. V.P.L.S. &c. British Museum
 Brown, R. esq. M.R.C.S. Preston, Lancashire
 Brown, Isaac, esq. Hitchin, Herts
 Browne, W. M. esq. Westminster Fire Office, King st. Covent garden
 Brydges, J. H. esq. F.L.S. &c. Boultonbrooke, Presteign, Radnorshire
 • Buckley, Nathaniel, M.D. Rochdale
 Budd, — M.D. Plymouth
 Bugin, T. esq. M.R.I.A. President of the Microscopical Society, Dublin
 Bull, J. esq. Godalming
 Burton, John, esq. Croom's hill, Greenwich
 Busk, George, esq. Dreadnought Hospital, Greenwich
 Butler, William, esq. Witham, Essex
 Buchanan, Walter, esq. Suffolk place, Hyde park gardens

 Callwell, Robert, esq. M.R.I.A. Herbert place, Dublin
 Canino, The Prince of
 Carr, William, esq. Hurst cottage, Blackheath park, Kent
 Carr, W. esq. M.R.C.S. Lee
 Carpenter, W. B. M.D. F.R.S. Fullerian Prof. Royal Inst. Ripley, Surrey
 Carey, Walter, esq. Chelt hill, Cheltenham
 Carter, J. esq. Petty Cury, Cambridge
 Chandler, A. T. esq. Godalming
 Chandler, Mrs. Bramley, near Guildford
 Children, J. G. esq. F.R.S. S.A. L.S. &c. Torrington square
 Christie, Dr. John, Keith, Banffshire
 Church, John, esq. Woodside place, near Hatfield, Herts
 Clapp, William, esq. Dreadnought Hospital, Greenwich
 Clark, Rev. J. D. the Hall, Belford
 • Clark, H. esq. Corpus Christi College, Cambridge
 Clark, Rev. Professor, M.D. Professor of Anatomy, Cambridge
 Clarke, Rev. Benjamin, J. Tuam, Ireland
 Clarke, W. B. M.D. 26, Dockwray square, North Shields
 Clarke, H. G. M.D. Berwick-upon-Tweed
 Clay, Mrs. P. Newwater Haugh, Berwick-upon-Tweed
 Clear, William, esq. Cork
 • Clifford, Rev. F. C. Elden Rectory, near Thetford, Suffolk
 Clifton, A. C. esq. Welwyn, Herts
 Clifton, James, esq. Melton, Romsey, Hants.
 Coates, John, esq. surgeon, Rochdale

- Collingwood, F. J. W. esq. Glanton Pyke, Whittingham, Northumb.
 Conyngham, Lord Albert, K.C.H. F.S.A. &c. Bournplace, Canterbury
 Conway, P. L. esq. Burton-under-Needwood, Litchfield
 Cooper, W. W. esq. St. John's College, Cambridge
 Cooke, James, esq. Lanesend Cottage, Melksham, Wiltshire
 Cooke, W. R. esq. Burford, Oxon.
 Cornwall Library, Truro
 Corsellis, C. C. M.D. Asylum, Wakefield
 Cottingham, E. esq. surgeon, Bexley, Kent
 Crampton, Sir Philip, Dublin
 Creswell, Rev. R. Salcombe Vicarage, Sidmouth
 Croker, Dr. C. V. M.R.I.A. Merrion square, Dublin
 Cruickshank, Alexander, esq. 12, Rose street, Aberdeen.
 Cullen, W. H. M.D. Sidmouth
 Cuthbertson, Donald, esq. LL.B. 110, Fife place, Glasgow
 Currer, Miss, Eshton hall, Yorkshire
 Currie, Robert, esq. Newcastle-on-Tyne
 Curtis, — esq. Harrow
 Cutler, Miss, Budleigh Salterton, Devonshire

 Dale, J. C. esq. M.A. F.L.S. C.P.S. &c. Glanville's Wooton, Sherborne
 Dalrymple, Sir J. Graham, bart. Hanover street, Edinburgh
 Dalrymple, John, esq. 56, Grosvenor street, Bond street
 Dalrymple, D. esq. Norwich
 Dallachay, Mr. John, Haddow-house, Aberdeen
 Darwin, C. esq. Down, Kent
 Daubeney, Professor, M.D. F.R.S. G.S. &c. Oxford
 Davies, Mrs. St. Leonard's place, York
 Davies, W. M. esq. Liverpool
 Davy, H. esq. Beccles, Suffolk
 Dawes, J. S. esq. F.G.S. West Bromwich, Staffordshire
 Deane, Henry, esq. Clapham common
 De la Beche, Sir H. F.R.S. G.S. &c.
 Dennes, G. E. esq. F.L.S. &c. Vine street, Golden square
 Devon and Cornwall Natural History Society
 Dickenson, Joseph, M.D. 25, Great George street, Liverpool
 Dickenson, William, esq. North Mosses, Liverpool
 Dickie, George, M.D. Lecturer on Botany, Aberdeen
 Dickson, Dr. Curzon street, May Fair
 Dillwyn, L. L. esq. Parkwern, Swansea
 Dilke, C. Wentworth, esq. 76, Sloane street
 Doubleday, Edward, esq. F.L.S. &c. British Museum
 Douglas, F. M.D. Kelso

Douglas, R. C. esq. Corpus Christi College, Cambridge
 Dover Proprietary Library
 Dowell, E. W. esq. Swaffham, Norfolk
 Dublin, Royal Society
 Duncan, P. esq. M.A. F.G.S. &c. Museum, Oxford
 Dundas, Mrs. Beechwood, Murrayfield, Edinburgh
 Dunnett, James, esq.

Eddison, Robert, esq. 14, High pavement, Nottingham
 Edwards, F. C. esq. 2, John street, Devonshire hill, Hampstead
 Edwards, Thomas, esq.
 Egerton, Sir P. G. Bart M.P. F.R.S. G.S. &c. Oulton park, Cheshire
 Elliott, John, esq. Kingsbridge
 Ellison, K. esq. surgeon, Liverpool
 Elsey, J. R. esq. Bank of England
 Elwes, John, esq. Bossington house, Stockbridge, Hants
 Embleton, Robert, esq. Embleton, near Alnwick
 Enniskillin, The Earl of, D.C.L. F.R.S. G.S. &c. Florence court,
 Enniskillin
 Evans, Mrs. Shenley hill, Herts
 Eyton, T. C. esq. F.G.S. Z.S. &c. Eyton Hall, Shrewsbury

Falconer, Dr. W. Tenby, South Wales
 Falconer, Dr. H. F.G.S. 23, Norfolk street, Strand
 Farre, Dr. Frederick, Bridge street, Blackfriars
 Fennell, James H. esq. Cedar House, Hillingdon, Uxbridge
 Fielding, George, M.D. F.R.S. &c. Hull
 Finsbury Medical Book Society, 2, St. Mary Axe
 Fitton, E. B. esq. 53, Upper Harley street
 Fitton, William H. M.D. F.R.S. &c. 53, Upper Harley street
 Fitton, W. J. esq. B.A. Trinity College, Cambridge
 Fletcher, Rev. C. Southwell, Nottingham
 Fletcher, Bell, M.D. Birmingham
 Flower, J. W. esq. 61, Bread street, City
 Forbes, Professor Edward, F.R.S. &c. King's College, London
 Forster, Edward, Esq. F.R.S. V.P.L.S. &c. Mansion House street
 Fox, Rev. Darwin, Delamere Rectory, Chester
 Fox, George T. esq. F.R.S. G.S. &c. Durham
 Frampton, Dr. A. New Broad street, City
 Freeborn, J. J. S. esq. 38, Broad street, Oxford
 Frere, H. T. esq. Corpus Christi College, Cambridge
 Fry, J. S. esq. 2, Charlotte street, Park street, Bristol
 Fryer, J. H. esq. Whitley House, Northumberland
 Fuge, J. H. esq. F.R.C.S.E. Plymouth
 Fyfe, W. W. esq. Berwick-on-Tweed

- Gall, A. C. esq. Ripley, Surrey
 Gandy, J. H. esq. Trinity College, Cambridge
 Gardner, W. H. esq. Jersey
 Garnons, Rev. L. P. u.D. Sidney College, Cambridge
 George, Richard F. esq. Gay street, Bath
 Gibson, G. S. esq. Saffron Walden, Essex
 Gillett, W. E. esq. Freshwater House, near Taunton
 Glasgow Philosophical Society
 Goadsley, Edward, esq. Albert place, Manchester
 Goatley, Thomas, esq. Chipping Norton, Oxon
 Goldsworthy, J. H. esq. High street, Stepney
 Goodsir, Harry D. S. esq. R.N.
 Goodsir, John, esq. College Museum, Edinburgh
 Gordon, Rev. George, Manse of Birnie, by Elgin, N B.
 Gott, William, esq. Leeds
 Gott, John, esq. Wither, near Leeds
 Gough, G. S. esq. M.R.I.A. Gren. Gds 45, Park st. Gros. sq. or Athenæum
 Gould, John, esq. F.R.S. L.S. Z.S. &c. 21, Broad st. Golden sq.
 Gourlie, William, J. esq. 8, South Frederick st. Glasgow
 Grainger, R. D. esq. F.R.S. &c. &c. Anerley, Norwood
 Gray, John, esq. M.D. Greenwich
 Gray, William, jun. esq. York
 Gray, T. esq. Monteith row, Glasgow
 Greenhill, Dr. Oxford
 Greening, William, esq. Marlborough place, Kent road
 Greenwood, Alfred, esq. Chelmsford, Essex
 Gretton, Rev. H. Nantwich Rectory, Cheshire
 Greville, R. K. LL.D. F.R.S.E. &c. George's square, Edinburgh
 Griffith, William, esq. Calcutta
 Griffith, Mrs. Torquay
 Gruggen, J. B. esq. surgeon, Chichester
 Grut, N. esq. F.R.S.E. &c. 5, Inverleith row, Edinburgh
 Gurney, J. H. esq. Earlham, near Norwich

 Hailstone, S. esq. F.L.S. Horton Hall, near Bradford, York
 Hull, John, esq. West road, Congleton
 Hall, C. R. esq. Holmes Chapel, Cheshire
 Hall, N. esq. Wortley, near Leeds
 Hamilton Rev. James, 7, Lansdown place, Brunswick square
 Hancock, John, esq. Newcastle-on-Tyne
 Hands, Benjamin, esq. Hornsey, Middlesex
 Hanley, Sylvanus, esq. Newington green
 Hansoh, Samuel, esq. 15, Trinity square, Tower hill
 Hanson, William, esq. Reigate

- Hardwicke, William, esq. Calthorpe street, Gray's inn lane
 Hardy, James, esq. 7, Mulgrave terrace, Gateshead
 Harley, James, esq. Leicester
 Harley, F. esq. Cortling stock, Nottinghamshire
 Harrinson, J. esq. Reading
 Harrison, J. B. esq. Barham, near Canterbury
 Harvey, J. R. M.D. 18, St. Patrick's place, Cork
 Harvey, W. H. esq. Trinity College, Dublin
 Haywood, J. W. esq.
 Head, Edward, esq. Mr. Crossing's, 15, Morrice square, Devonport
 Henderson, W. T. esq. London and Westminster Bank, Lothbury
 Henderson, Thomas, esq. South Dispensary, Liverpool
 Henfrey, Arthur, Esq. F.L.S. &c. Museum of Economic Geology
 Hepburn Sir T. B. M.P. Smeaton, Preston Kirk, N.B.
 Hepburn, Thomas B. esq. Shabden park, Chipstead, Reigate
 Hepburn, A. esq. Whittingham, near Preston Kirk, Mid Lothian
 Heppenstall, John, esq. Upper Thorpe, near Sheffield
 Heslop, R. C. M.D. Preston, Lancashire
 Hewitson, J. esq. Corpus Christi College, Cambridge
 Hewlet, George, esq. Harrow
 Heysham, T. C. esq. Carlisle
 Higgins, C. H. esq. Taunton
 Hill, W. T. esq. Portwood hall, near Stockport
 Hinckes, Rev. William, Hampstead
 Hindle, James, esq. Norton, near Doncaster
 Hitch, J. W. esq. Gloucester
 Hodgson, H. B. esq. Acomb House, York
 Hodson, Joseph, esq. surgeon, Birmingham
 Holland, William, esq. Light Cliff, near Halifax, Yorkshire
 Hore, Rev. W. S. M.A. F.L.S. &c. 30, Trafalgar pl. Stoke, Devonport
 Horne, C. esq. Clapham Common
 Horner, Leonard, esq. 2; Bedford row
 Horrocks, Miss E. M. Antermoney house, Lennox town, Glasgow
 Horsfield, Dr. F.R.S. L.S. G.S. &c. India house, London
 Howitt, Thomas, esq. Leicester
 Hoyer, J. esq. Crown court, Threadneedle street
 Hudson, Anthony, esq. Norwich
 Hudson, R. esq. F.R.S. G.S. &c. Clapham common
 Humphries, Edward, esq. surgeon, Kingsland
 Hunter, M. esq. 22, Artillery place, Finsbury
 Huntingdon, Frederick, esq. Hull
 Husband, W. D. esq. surgeon, York
 Hutton, Thomas, esq. F.G.S. M.R.I.A. &c. Dublin
 Hyndman, George C. esq. Belfast

Ibbotson, S. L. B. esq. 22, Upper Phillimore place, Kensington
 Ick, W. D. PH. F.G.S. &c. Philosophical Institution, Birmingham
 Image, Rev. Thos. A.M. F.G.S. &c. Whepsted, near Bury St. Edmund's
 Ingham, Robert, esq. M.A. F.G.S. &c, Westoe
 Inglis, James, M.D. Halifax, Yorkshire
 Ipswich Philosophical Society
 Ireland, Royal Zoological Society of
 Irvine, Hans, esq. M.B. Dublin
 Isaacson, W. esq. Huntingdon

Jackson, Dr. Oxford
 Jackson, H. esq. James's row, Sheffield
 James, Captain R. E.
 Janson, Joseph, esq. F.L.S. 32, Abchurch lane
 Jardine, Sir W. Bart. F.R.S.E.L.S. &c. Jardine hall, Lockerby, Dumfries
 Jefferson, J. esq. St. John's College, Cambridge
 Jeffreys, J. G. esq. F.R.S. L.S. &c. Swansea
 Jenyns, Rev. L. M.A. F.L.S. C.P.S. &c. Swaffam Bulbeck
 Jepson, W. M.D. 80, Chapel street, Salford
 Johnston, George, M.D. LL.D. F.R.C.S.E. Berwick-upon-Tweed
 Jones, Capt. M.P. F.G.S. &c. 30, Charles street, St. James's
 Jones, — esq. 23, Soho square
 Johnson, J. W. esq. Ipswich
 Joy, Thomas, esq. 10, St. Giles's street, Oxford
 Jubb, Abrām, esq. surgeon, Halifax

Kane, W. esq. B.A. T.C.D. Exmouth
 Kay, David, M.D. Bradford, Yorkshire
 Keenlyside, R. H. M.D. Stockton-on-Tees
 Keman, J. esq.
 Kennedy, J. M.D. Woodhouse, near Loughborough
 Kennedy, James, M.D. Ashby de la Zouch
 Kenrick, Miss, Stonehouse, near Canterbury
 Kernon, Thomas, esq. Avebury house, Marlborough, Wilts
 King, R. L. esq. St. John's College, Cambridge
 King, John, esq. Ipswich
 King, Richard, M.D. Sackville street
 King, Henry, Castle gate, York
 Kirkman, Dr. Melton, near Woodbridge, Suffolk
 Kitching, Alfred, esq. 57, Myton gate, Hull
 Kitching, John, esq. Darnell hall, near Sheffield
 Kitching, W. V. esq. St. John's College, Cambridge
 Knapp, Dr. 9, Duncan street, Edinburgh
 Knapp, J. L. esq. Thornbury, Gloucestershire (Alverston)
 Knowles, Professor C. B. Birmingham
 Köninck, L. de, esq. Liége

- Lacy, E. esq. M.R.C.S. &c. Poole, Dorset
 Landsborough, Rev. D. Park-end; Saltcoats, Ayrshire
 Lane, E. esq. Plymouth
 Langmore, Dr. 40, Finsbury square
 Langmore, W. B. esq. 4, Christopher street, Finsbury square
 Langstaff, J. esq. 9, Cambridge square, Hyde park
 Lankester, E. M.D. F.L.S. Golden square, London
 Lay, Rev. H.
 Laycock, Dr. C. R. 5, Adelaide road, Haverstock hill
 Leckenby, John, esq. Scarborough, Yorkshire
 Lee, Dr. F.R.S. F.R.A.S. &c. Hartwell, near Aylesbury, Bucks.
 Lee, Rev. James P. King Edward's School, Birmingham
 Lee, W. S. esq. Morningside, near Aberdeen
 Leeson, Dr. Greenwich
 Leighton, Rev. W. A. B.A. F.B.S.E. &c. Luciefield, Shrewsbury
 Leslie, James, esq. Chanonry, Old Aberdeen
 Lindley, Professor, D. PH. F.R.S. &c. 21, Regent Street
 Lingin, Charles, M.D. Hereford
 Lingwood, R. M. Esq. M.A. F.L.S. &c. Lyston house, Ross, Hereford
 Lister, J. J. esq. F.R.S. Upton, near Stratford, Essex
 Little, Rev. William, Manse, Kirkpatrick, Moffat
 Litton, Professor, M.D. R.D.S. &c. Dublin
 Liverpool Library, Lyceum
 Liverpool Natural History Society
 Liverpool Medical Institution
 Liverpool Royal Institution
 Lizars, W. H. esq. St. James's square, Edinburgh
 Lizars, Professor A. J. M.D. 17, King street, Aberdeen
 Lloyd, Rev. M. H. M.A. Goodnestone, near Canterbury
 Lloyd, William Horton, esq. Park square, Regent's park
 Loftus, W. K. esq. Caius College, Cambridge
 London Institution, Finsbury Circus
 Lovejoy, — esq. Reading
 Luard, William W. esq. Witham lodge, Witham, Essex
 Lush, Charles, M.D. F.L.S. &c. Bombay Army
 Lye, James Black, M.D. Hereford
 Lyell, Charles, M.A. F.R.S. L.S. G.S. &c. 16, Hart street, Bloomsbury
 Macdonald, Alexander, esq. 5, Regent terrace, Edinburgh
 Macdonald, W. B. esq. Rammerscales, Lochmaben
 Mackintosh, George, esq. Campsie, near Glasgow
 Mackintyre, Dr. F.L.S. Hackney
 Mackenzie, Skelton, esq. LL.D. Dublin
 Maclagan, Douglas, M.D. 129, George street, Edinburgh
 Maclagan, P. W. M.D. Assistant Surgeon in the Army, Canada
 Macmeikan, John, esq. London Hospital

Manchester Natural History Society**Manchester, The Hon. and Rev. Dean of, York****Marshall, Matthew, esq. Bank of England****Marshall, Timothy, esq.****Martin, Dr. Glendale, Isle of Skye****Martin, Dr. Adam, Rochester, Kent****Matteson, William, jun. esq. surgeon, York****Maund, Benjamin, esq. Brooms Grove, Worcestershire****Maxwell, Wellwood, esq. Munshes Castle, Douglass****Mc Andrew, R. esq. Liverpool****Meggy, George, esq. Chronicle Office, Chelmsford****Melrose, Jonathan, esq. Writer, Coldstream, Berwickshire****Mercer, James, M.D. F.R.C.S.E. 50, Northumberland st, Edinburgh****Meynell, Thomas, esq. York****Miers, John, esq. Temple lodge, Hammersmith****Miller, O. T. esq. Royal Marine Infirmary, Plymouth****Miller, George, esq. M.R.C.S.E. Emsworth, Hants****Mitchell, Alexander, esq. 20, Upper Kirk gate, Aberdeen****Mitchell, D. W. esq. 5, Mortimer street, Cavendish square****Mitchell, Dr. Mauchline, Argyleshire, N.B****Mitford, Captain, Hunmanby, Yorkshire****Moggeridge, Matthew, esq. Swansea****Moon, William, esq. surgeon, Tottenham, Middlesex****Moore, J. C. esq. 37, Hertford street, May Fair****Mordaunt, John, esq. Ashton Water, near Bristol****Morris, Beverley, M.D. York****Morris, John, esq. 6, Lower Durnford square, Stonehouse, Devon.****Munford, Rev. George, East Winch Vicarage, Lynn****Munn, W. A. esq. Knowley house, Feversham, Kent****Munro, Miss, Fritham, Stoney cross, Hants****Murchison, R. I. esq. F.R.S. &c. Belgrave square****Murdoch, W. M.D. 320, Rotherhithe street****Murray, Patrick, M.D. Scarborough, Yorkshire****Napp, J. L. esq.****Nasmyth, Alex. esq. F.L.S. G.S. &c. 13, George st. Hanover square****Naylor, G. F. esq. Asylum, Wakefield****Neill, Patrick, LL.D. F.R.S.E. L.S. &c. Cannon Mills, Edinburgh****Nelson, Jno. G. esq. Colchester, Essex****Neville, Henry, esq. Hervey hill, co. Londonderry, Ireland****Newbold, W. W. esq. B.A. Sharrow Bank, Sheffield****Newcastle Literary and Scientific Society****Newman, Edward, esq. F.L.S. 9, Devonshire street, Bishopsgate****Newnham, W. O. esq. St. John's College, Cambridge****Newnham, William, esq. Farnham, Surrey**

Newport, George, esq. Pres. Ent. Soc. Southwick st. Cambridge ter.
 Norfolk and Norwich Literary Institution
 Norman, George, esq. F.G.S. &c. Beverley road, Hull
 Norris, Henry, esq. South Petherton
 Northampton, the Marquess of, P.R.S. &c. 145, Piccadilly
 Norwich, the Lord Bishop of
 Nuppeley, Thos. esq. Surgeon, Leeds.
 Nutford, Capt. Hunmanby, Yorkshire

Ogle, W. esq. Catherine Hall, Cambridge
 Ogilvie, J. F. esq. Morningside Lunatic Asylum
 Owen, Professor, F.R.S. L.S. &c. Royal College of Surgeons

Parker, C. L. esq. Oxford
 Parkinson, esq. F.L.S. Cambridge terrace, Hyde park
 Parnell, R. M.D. F.R.S.E. &c. 50, Rankeilior street, Edinburgh
 Pattisson, Jacob L. esq. LL.B. Witham House, Witham
 Pattisson, J. H. esq.
 Patterson, Robert, esq. Belfast
 Paxton, Jas. M.D. Rugby
 Pearce, J. C. esq. Bradford, Wilts, near Bath
 Percival, W. esq. 1st Life Guards, Regent's Park Barracks
 Pereira, J. M.D. F.R.S. &c. Finsbury square
 Percy, Edmund, esq. Nottingham
 Percy, J. M.D. Birmingham
 Phelps, Rev. H. D. Snodland rectory, West Malling, Kent
 Pigge, Thomas, jun. esq. 7, Ridley place, Newcastle-on-Tyne
 Pinder, Rev. George, Sedburgh, Yorkshire
 Playfair, Lyon, Dr. Museum Economic Geology
 Plomley, James, F. esq. Rye, Sussex
 Plomley, Francis, M.D. Ph.D. F.S.A. &c. Lydd, Romney Marsh, Kent
 Pollexfen, Rev. J. H. Bradford, Yorkshire
 Powell, Hugh, esq. Clarendon street, Somers Town
 Power, Thomas, M.D. St. Patrick's hill, Cork
 Price, William, esq. Leeds
 Price, Thomas T. esq. Surgeon, Hereford
 Prower, Rev. J. M. Purton, near Swindon, Wilts
 Phillips, Professor John, F.R.S. G.S. &c. Dublin
 Player, Mrs. Tenby, South Wales
 Pratt, S. P. esq. 53, Lincoln's inn fields
 Preston Literary and Philosophical Society
 Prestwich, Joseph, jun. esq. Mark lane.

Quain, Richard, M.D. University College Hospital
 Quekett, E. J. esq. F.L.S. 50, Wellclose square

- Rahan, R. B. Captain, R.N. Taunton
 Radcliffe Library, Oxford
 Rankin, Robert, esq. Hastings, Sussex
 Ranking, W. H. M.D. Bury St. Edmunds
 Ransome, Robert, esq. Ipswich
 Raper, W. A. M.D. Parade, Portsmouth
 Rawson, T. W. esq. Halifax, Yorkshire
 Rawson, John, esq. Skirbeck, near Boston
 Ray, George, esq. Milton, near Sittingbourne, Kent
 Ray, John, esq. Heaver Hall, Derbyshire
 Reade, Rev. J. B. Stone Vicarage, near Aylesbury, Bucks
 Reid, F. G. M.D. Hertford
 Reid, John, M.D. St. Andrews
 Reeve, Lovell, esq. A.L.S. &c. King William street, Strand
 Reckitt, William, esq. M.A. &c. High street, Boston, Lincolnshire
 Reigate Institution, Reigate, Surrey
 Reynolds, Henry, esq. 42, Moorgate street
 Richardson, John, M.D. F.R.S. L.S. &c. Haslar Hospital, Gosport
 Ringrove, John esq. Potters Barr
 Robb, James, M.D. Prof. Nat. Hist. King's College, Frederickton,
 New Brunswick
 Robertson, W. esq. F.Z.S. Newcastle-on-Tyne
 Robertson, W. H. M.D. Buxton, Derbyshire
 Robertson, John, R. esq. Grove Cottage, Duffield row, Derby
 Robinson, George, esq. Armagh
 Rohloff, — esq. Plymouth
 Rolfe, Rev. S. C. E. N. Heacham Hall, Lynn, Norfolk
 Ross, Andrew, esq. 21, Featherstone buildings, Holborn
 Rothery, H. C. esq. B.A. 10, Stratford place
 Royal Irish Academy, Dublin
 Royal Zoological Society of Ireland
 Royle, Prof. J. F. M.D. F.R.S. L.S. G.S. &c. 4, Bulstrode street,
 St. Marylebone
 Rudd, E. J. esq. Halifax, Yorkshire
 Russell, F. esq. Brislington, Bristol
 Rutherford, W. esq.

 Sabine, W. esq. B.A. Jesus College, Cambridge
 Sabine, Colonel
 Salmon, John, D. esq. Godalming
 Salter, T. Belf. M.D. F.L.S. Ryde, Isle of Wight
 Salter, H. H. esq. King's College
 Sandwith, Humphry, M.D. 1, Albion street, Hull
 Satterfield, Joshua, esq. Manchester
 Saull, W. D. esq. F.G.S. A.S. &c. 15, Aldersgate street

- Say, Rev. F.H.S. Braughing Vicarage, Ware, Herts
 Sayle, George, esq. Lyme Regis
 Seager, J. L. esq. Millbank, Westminster
 Searle, George, esq. Cumming street, Pentonville
 Sedgwick, Rev. Adam, F.R.S. &c. Cambridge
 Selby, Prideaux, J. esq. F.L.S. G.S. &c. Twizel, Northumberland
 Sellers, William, M.D. Royal College Physicians, Edinburgh
 Semple, Robert H. esq. 3, Hans buildings, Islington
 Shaw, Dr. Hophouse, near Boston, Lincolnshire
 Shapter, Thomas, M.D. Exeter
 Sharp, Henry, esq. Bolton-le-Moor, Lancashire
 Sheppard, James, M.F. Stonehouse, Devonport
 Shuttleworth, Robert James, esq. Berne
 Shuttleworth, John, esq. Manchester
 Sidney, M. J. F. esq. Cowper, near Morpeth
 Simpson, J. Y. M.D. Prof. Midwifery University Edinburgh
 Simpson, Samuel, esq. The Greaves, Lancaster
 Sion College Library, London Wall
 Slaney, W. H. esq. care of T. C. Eyton, esq. Eyton Hall, Shrewsbury
 Smith, Alfred, esq. M.R.C.S. St. Paul street, Portland square, Bristol
 Smith, J. J. esq. M.A. Caius College, Cambridge
 Smith, Dr. Pye, Homerton
 Smith, Charles, esq. M.R.C.S. Bury St. Edmunds
 Smyth, W. H. esq. Caius College, Cambridge
 Society, Philosophical, of Glasgow, (Botanical Section)
 Society, Literary and Philosophical, Newcastle-on-Tyne
 Solly, R. H. esq. F.R.S. L.S. &c. Great Ormond street, Queen square
 Sowerby, James de C. esq. F.L.S. Z.S. &c. Royal Botanic Garden,
 Regent's park
 Spence, W. esq. F.R.S. L.S. &c. 18, Lower Seymour st. Portman sq.
 Spence, Rev. John, East Keal, Spilsby, Lincolnshire
 Spicer, J. W. G. esq. Esher place, Esher, Surrey
 Spragge, W. K. esq. South Down buildings, Tor, Devonshire
 Stanger, W. M.D. Cape of Good Hope
 Stark, Robert, M. esq. Annandale street, Edinburgh
 Statham, Rev. S. F. Waldon terrace, Torquay
 Statter, William, esq. Wakefield
 Stead, Edward, esq. Morrice street, Devonport
 Steel, C. W. esq. Lewisham
 Steuart, Sir James, Bart.
 Stevens, W. V. esq. Pembroke square, Kensington
 Stewart Allan, M.D. 50, High street, Paisley
 Stock, Daniel, esq. Bungay
 Stokes, W. R. esq. Shrewsbury

- Stokes, Charles, esq. F.R.S. G.S. &c. 4, Verulam buildings, Gray's Inn
 Strickland, Hugh E. esq. M.A. F.G.S. &c. 39, Holywell, Oxford
 Strickland, Arthur, esq. Bridlington Quay, Yorkshire
 Strickland, J. H. esq. 22, North Audley street
 Streeten, R. J. N. M.D. Worcester
 Sweetlove, J. esq. Liverpool, Nat. Hist. Soc.
 Swineard, Frederick, esq. Precentor's court, York
 Subscription Library, Bromley house, Nottingham

 Tancred, Sir Thomas, Bart. Shotley hill
 Tate, George, esq. F.G.S. Alnwick, Northumberland
 Tatham, John, esq. jun. Settle, Yorkshire
 Taylor, Richard, esq. F.L.S. S.A. &c. Red Lion court, Fleet street
 Taylor, Henry, M.D. Nottingham Dispensary
 Teale, Joseph, esq. Leeds
 Teale, T. P. esq. Leeds
 Tennant, James, esq. F.G.S. &c. 149, Strand
 Theakstone, J. W. esq. Scarborough, Yorkshire
 Thomas, W. L. esq. Hatfield
 Thomas, Henry, esq. Sheffield
 Thompson, Thomas, esq. M.A. F.R.S. &c. Solicitor, Hull
 Thompson, W. esq. Pres. Nat. Hist. Soc. Belfast
 Thompson, Theophilus, M.D. Bedford square, London
 Thomsun, R. D. M.D. Glasgow
 Thomson, Professor Allen, 26, India street, Edinburgh
 Thornhill, J. esq. Lit. and Phil. Soc. Newcastle-on-Tyne
 Thorpe, Rev. W. Wormersley, near Pontefract, Yorkshire
 Tomkins, C. M.D. Abingdon
 Torquay Natural History Society
 Torrie, T. J. esq. F.G.S. &c. 21, Royal Circus, Edinburgh
 Travis, J. H. esq. York
 Trinity College, Dublin
 Tripe, Dr. Plymouth
 Troughton, Nathaniel, esq. Coventry
 Tudor, Richard, esq. Bootle, Liverpool
 Tuke, W. M. Esq. York
 Tuke, James, H. esq. York
 Turner Dawson, esq. F.R.S. S.A. L.S. &c. Yarmouth
 Tweedy, M. esq. Alverton, Truro
 Twining, William, M.D. 13, Bedford place, Russell square
 Twiss, Travers, Dr. Prof. Political Economy Univ. Coll. Oxford.

 Varenne, E. G. esq. Kelvedon, Essex

 Waller, Edward, esq. Finnow House, Burrisakane, Ireland

- Walker, D. esq. M.A. Colchester, Essex
 Walker, J. jun. esq. Axbridge, near Wells, Somerset
 Walmsley, V. Q. esq. Westwood House, near Wigan, Lancaster
 Walton, John, esq. F.L.S. &c. 9, Barnsbury square, Islington
 Walton, Richard. esq. Cambridge
 Warburton, H. esq. M.P. F.R.S. PRES. G.S. &c. 45, Cadogan pl. Chelsea
 Ward, N. B. esq. F.L.S. Z.S. &c. Wellclose square
 Ward, N. esq. London Hospital
 Warrington, Robert, esq. Apothecaries Hall
 Warren, T. W. esq. 40, Blessington street, Dublin
 Warwickshire Natural History Society
 Watson, James, M.D. St. Vincent street, Glasgow
 Webb, J. E. esq. Bungay
 Weddell, Robert, esq. Berwick-on-Tweed
 Weeks, Richard, esq. Hampton Lodge, Hurst Pierpoint, Brighton
 Wharton, Rev. Thomas, Bath, Jamaica
 Wheatstone, Professor, King's College
 Wheeler, Mrs. 2, Sussex place, Southampton
 Whish, H. esq. Corpus Christi College, Cambridge
 White, Adam, esq. British Museum
 White, A. D. M.D. Winchester
 White, C. G. esq. Poplar
 White, Alfred, esq. F.L.S. &c. Cloudesley square, Islington
 White, H. H. esq. 13, Old square, Lincoln's Inn
 Whitehaven Library
 Whiting, James B. esq. King's Lynn, Norfolk
 Whitla, F. esq. Belfast
 Wickenden, Joseph, esq. Surgeon, Birmingham
 Wickham, W. J. esq. Winchester
 Williams, Rev. J. Euston Glebe, Chorley, Lancashire
 Willoughby, Edward, esq. Sutton Coalfield, Warwickshire
 Wilson, Charles, M.D. Kelso
 Wilson, T. J. esq. Surgeon, Lockerby
 Winchester, The very Rev. the Dean of
 Windsor, John, esq. F.L.S. F.R.C.S.E. &c. Manchester
 Winn, Charles, esq. Nostell, near Wakefield
 Winter, T. B. esq. Cannon place, Brighton
 Winterbottom, P. M. M.D. Westoe, S. Shields
 Winterbottom, James Edward, esq. F.L.S. &c. Newbury, Berks
 Wintle, G. S. esq. Eastgate street, Gloucester
 Wix, Rev. J. W. Helvedon
 Wix, Rev. S. F.R.S. A.S. St. Bartholomew's Hospital
 Wollaston, T. V. esq. Jesus College, Cambridge
 Wood, S. V. esq. F.G.S. &c.

Wood, Neville, M.D. Lower Belgrave street, Belgrave square

Wood, Samuel, esq. A.M. M.B. Avenue House, Bandon, co. Cork

Wood, Basil, T. esq. F.L.S. &c. 14, Great Cumberland street

Woodford, Dr. Taunton

Woolley, J. esq. Trinity College, Cambridge

Wright, C. P. esq. 6, Glasshouse street, Regent street

Wright, G. P. esq. Auburn Cottage, Hawley road, Kentish town

Yarrell, William, esq. F.L.S. z.s. &c. Ryder street, St. James's street

Young, James. esq. Hull

Young, Dr. J. F. F.R.S. &c. Upper Kennington lane

